Excavations at the Gallo Mountain Sites, NM 32, Catron County, New Mexico

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EXCAVATIONS AT THE GALLO MOUNTAIN SITES, NM 32, CATRON COUNTY, NEW MEXICO

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ADMINISTRATIVE SUMMARY

This report presents the findings of a project conducted on behalf of the New Mexico State Highway and Transportation Department in 1976 and 1977. All excavations were within NM 32 right-of-way in Catron County. Sites investigated include residential sites (LA 5407, LA 6075, LA 6076, LA 14858, LA 14908, LA 14909), fieldhouse sites (LA 14882, LA 14907, LA 14910), artifact scatters (LA 14906, LA 14917, LA 14920, LA 14930), soil- and water-control features (LA 14463, LA 14913, LA 14915, LA 14916, LA 14918, LA 14919), scattered materials from sites that lie outside the right-of-way (LA 6074, LA 6077), and alignments that turned out to natural rather than cultural (LA 14914). Dates range from the Archaic through the Late Pithouse period, and most date to the Early Pithouse period.

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INTRODUCTION

The New Mexico State Highway and Transportation Department's decision to shorten the road from Quemado to NM 12 by creating a new alignment for NM 32 initiated a long and complex series of archeological investigations (Kayser 1976:3). What was then the Contract Archaeology Section of the Laboratory of Anthropology surveyed the 13.7 km right-of-way in March 1972 and conducted excavations during July and August. Seven of the ten sites located by the survey were investigated. The remaining sites were on private land and could not be investigated until the right-of-way was acquired for that section (Kayser 1973:1).

This first phase, the Castle Rock Project, was directed by David W. Kayser (1973). No artifact analysis is included in the report, and apparently none was done. The sites include a small Archaic camp (LA 5411) with a single unlined circular hearth; a series of water-control features and an associated fieldhouse (LA 5406); a large complex of water-control features, of which three were tested (LA 10, LA 984); a portion of a pithouse village with three pit structures and four storage pits (LA 5407); the remains of a small pueblo, which had been bulldozed (LA 5409); a single-room fieldhouse and two small check dams (LA 5408); and a light trash scatter from a pithouse site outside the right-of-way (LA 6074). A number of water-control devices, which were not given site numbers, are described in general terms (Kayser 1973:17-20). Sites that were located but not investigated were LA 6075, LA 6076, and LA 6077.

The right-of-way was resurveyed in August 1976, and five additional sites were located (Kayser 1976). In the survey report, Kayser presented the basic hypotheses and/or assumptions to be addressed by excavations at the five sites. He began with the assumption that the inhabitants of the Largo Valley were similar to other northern Mogollon groups and occupied small communities linked by and dependent on systems of land and labor-intensive horticulture. These early settlements (Pine Lawn phase) were basically Mogollon, with no significant Anasazi traits. The late sites (Reserve phase) with Anasazi traits were thought to result from the participation of Mogollon communities in a larger regional exchange system. Participation was made possible by the accumulation of agricultural surplus or crop specialization. Anasazi traits were viewed as accretions onto existing patterns, rather than a mixing of cultures or groups. Finally, the water-control systems were supposed to represent increasing specialization, deceases in effective crop land, and a concomitant increase in the population of the valleys (Kayser 1976:36-37).

Excavation of the second group of sites began in October 1976 as Gallo I. In addition to the five sites, LA 14858 was discovered and excavated. Located on the side of a hill, this row of rooms and pit structure were completely covered by soil deposited from the upper portion of the hill. Except for a few sherds at the base of the slope, there were no indications of the site. This new information on erosional processes and heavy deposition prompted another survey of the right-of-way (Kayser and Dart 1977).

Intensive survey of the right-of-way located 23 additional "cultural resources," six of which were outside the right-of-way. Ten sites were recommended for excavation (Kayser and Dart 1977:20). Permission to proceed at the additional sites was received, and excavation began in April 1977 as Gallo II. During the Gallo II fieldwork, a highway contractor blading an access road within the right-of-way uncovered a large charcoal stain leading to additional work at LA 5407, one of the original Castle Rock sites. Fieldwork was completed early in September 1977. Table 1 lists the duration and timing of work at the sites reported here. Much of the Gallo I excavation took place during the cold season, and crews alternated between sites. During Gallo II, as many as five sites were worked in a single day.

Throughout the excavation stage, David W. Kayser served as project director and David H. Snow as principal investigator. The assistant archaeologist position was held by Al Dart (Gallo I), followed by Oliver Kit McCrary (Gallo II). David G. Killam was the cataloguer-recorder, and C. Wayne Oakes and Steven J. Parmenter worked on portions of the project. Labor was recruited from the area. Barbara Mauldin, Rosemary Talley, and Valerie Pletteberg processed the artifacts and analyzed ceramics, lithic artifacts, and ground stone.

David W. Kayser left the Laboratory of Anthropology early in 1978, and in 1979 David H. Snow was asked to prepare a research design and budget for completing the analyses and a final report. Dendrochronological samples were submitted, and a considerable number of flotation and vegetal samples were sent to Richard I. Ford at the University of Michigan.

Snow reformulated the research considerations and prepared a budget (Snow n.d.). However, his request for additional funds was denied, and no analysis was done until 1983, when the funds withheld from the original contract were released. Glen Condon wrote site descriptions, Sandra L. Rayl the ceramic analyses, Steven S. Post the lithic analyses, and Charles A. Hannaford the ground stone analyses. No work was done on the LA 5407 materials, probably because funds were insufficient, the quantity of materials recovered from the site was large, and the site was too significant to be rushed.

In 1987 Yvonne R. Oakes, acting director of what was then the Research Section, secured additional funds from the New Mexico State Highway and Transportation Department to complete the project. As might be expected, those involved with this final phase of the project encountered considerable problems. Difficulties inherent in working with someone else's notes and data were compounded by changes in archeological standards. Much of the information considered necessary to an excavation report today simply was not recorded. Similarly, much of what was recorded was conflicting or in the form of conclusions, rather than the evidence that led to the conclusions, which can be evaluated. Conflicting information has generally been resolved in favor of whomever was closer to the situation, the assistant archeologist rather than the project director, and the actual excavator rather than the site recorder. Site and feature maps were occasionally replaced or liberally supplemented by maps drawn from bipod photos.

The basic goals of this report are to describe the sites and the material recovered from this little-known area, to contrast the adaptations represented by the early and late sites, and to consider the nature of the interaction with the Anasazi groups a few miles to the north.

Several decisions had to be made regarding the analyses. Because of the large quantity and quality of vegetal material recovered from LA 5407, macrobotanical and flotation analyses were given a high priority, and none of the pollen samples were analyzed. To address changes in adaptation and provide a contrast with LA 5407, samples were drawn from other sites, leaving the number of samples from any one site relatively small. Numerous dendrochronological samples had already been sent and dated. Radiocarbon dates supplemented these wherever possible. Unfortunately, except for LA 5407, little charcoal was collected, and the few dates obtained were disappointing. Petrographic analysis is the primary means used to address the Mogollon and Anasazi interaction because few other materials can be traced with the same degree of precision.

In order to address these goals it was necessary to go back to the original notes and compile new site descriptions. Charles A. Hannaford's ground stone analyses and portions of Rosemary Talley's original ceramic analysis have been incorporated as written. However, nearly all of the tables from earlier analyses, particularly the ceramic analysis, had to be reformulated to match provenience divisions and add vessel forms. Karen Wening similarly found it necessary to reanalyze and retabulate many of the lithic artifacts.

James L. Moore pulled together the descriptions of the water-control devices and evaluated them. Karen Wening analyzed and reanalyzed may of the lithic artifacts, and all of the ground stone, lithic artifacts, and basketry from LA 5407. Mollie S. Toll and Pamela J. McBride analyzed the macrobotanical remains and flotation samples, and Elizabeth M. Garrett did the petrographic analysis.

PHYSICAL ENVIRONMENT

The project area is in the northern portion of Catron County, approximately 16 km south of Quemado (Fig. 1). Most of the sites are within the Apache National Forest and, with the exception of the southern most sites, along Largo Creek.

The majority of the Gallo sites are on the east side of the Largo Valley at elevations between 2,195 and 2,255 m (Appendix 1). The valley is generally narrow and bordered by steep ridges, mesas, and hills. Drainages and valleys intersecting the east side are U-shaped with relatively flat floors, while those to the west tend to be narrow and V-shaped (Kayser 1976). The slopes are steeper on the west side, contributing to the greater site density on the ridges to the east of the creek. The valley is wider at the northern end of the project area and narrows considerably.

Largo Creek flows north from the slopes of the Gallo Mountains, a short east-west-trending range. It is an intermittent stream fed by small springs, and it disappears underground about 8 km south of Quemado. Flow is north and northwest into Zuni Salt Lake. Surface water from the creek has a bitter taste (Kayser 1976:7-8; Tierney 1973a:3).

Largo Valley lies in a finger of the Upper Sonoran life zone, which projects into the Transitional zone of the Gallo Mountains. Plants characteristic of this zone are piñon and juniper. Yellow pine is scattered on north-facing slopes and along the valley bottom. Narrowleaf cottonwoods are found near the creek, and scrub oak on southeastern exposures (Tierney 1973a:3).

Kayser describes the soils on the ridges, mesas, and hills as a thin upper stratum of humus, sand, and gravel overlying a sterile layer of dense yellow soil. Below this are areas of hard white caliche and several meters of rocky conglomerate. The valley bottom is compact, darker-colored soil of humus, sand, clay beds, and gravel, which overlie yellow soils (Kayser 1976:7).

The soil along Largo Creek is classified as fluventic haploborolls-aquatic ustifluvents by the USDA Forest Service (1988) and Pietown-Hickman by the Soil Conservation Service (Johnson 1985). Upland soil is considered typic ustochrepts and mesic-fluventic ustochrepts (USDA Forest Service 1988) or typic ustorthents-Hickman (Johnson 1985).

Willard describes the sedimentary facies of the surrounding valley as part of the Datil Formation. In the Gallo Mountains, this formation is conglomeritic with pebbles and cobbles of various rock types, but latite and andesite predominate (Willard 1959:96). See Garrett (this volume) for a detailed description of the geologic formations.

Climate in the northern portion of Catron County varies depending on elevation and topography. Precipitation ranges between 23 and 51 cm with an increase of 10 cm for each 305 m increase in elevation. Winter is the driest season, when Pacific Ocean storms lose much of their moisture to the mountains to the west. Summer moisture is mainly from the Gulf of Mexico, and half the annual precipitation falls from July through September, often as brief thunderstorms. In northern Catron County, the frost-free period lasts from June to late September, about 120 days in most of the area, but more like 90 days above 2,134 m (Houghton 1985:1-2). Annual precipitation at Luna Ranger Station (elevation 2,149 m) over 51 years averages 39.2 cm, and at Quemado Ranger Station (elevation 2,079 m), 24.9 cm (Gabin and Lesperance 1977). At Largo Mesa, west of the project area (summit 2,438 m), precipitation averages 40.6 cm, with 72 percent falling between May and October. The annual mean temperature is 8.9 C, and the frost-free period is 150 days (Dunmire and Toll n.d.:2-3).

In the southwest, modern climatic conditions have existed since about 5500-5000 B.C. A period of greater effective moisture than at present began around 3000 B.C., continuing until ca. A.D. 500 to 600. Human expansion and population size increased during that time (Irwin-Williams 1979:31-32).

ARCHAEOLOGICAL BACKGROUND

Rather than a broad overview of the Anasazi and Mogollon occupations of western New Mexico, this chapter will concentrate on the Quemado area and Mogollon settlement patterns. Overviews describing the prehistory of this areas include the USDA Forest Service overview for the Socorro area (Berman 1979) and Stuart and Gauthier's *Prehistoric New Mexico* 1981). Summaries of the Quemado area can also be found in Camilli et al. (1988) and Hogan (1985 and 1987).

Peabody Museum

In 1947 Edward B. Danson, representing the Peabody Museum of Harvard University, began a survey of west-central New Mexico and east-central Arizona. He drove throughout the area locating as many sites as possible, then spent the following two summers on a more intensive survey of several of the northern areas and a reconnaissance of a 120 sq km area. The survey was generally confined to valley areas (Danson 1957:4).

Among the areas surveyed were the Largo and Agua Fria Valleys. Thirty-one sites were located during "short visits" to the valleys, and these "probably represent but a few of the sites that could be found in these 2 valleys, particularly in the longer, better watered Largo." Danson notes the presence of pithouse sites on the tops of flat bluffs or on hillsides well back from the main valleys. Later sites (A.D. 700-1100) were more common, with residential sites of four or more rooms generally located on ridges overlooking agricultural land. A few large pueblos and scattered fieldhouses were also observed. Sites dating from A.D. 1100 to 1300 were fewer but larger, suggesting to Danson a shift from small family units to larger urban communities. St. Johns Polychrome, an indicator of later occupations, was not found (Danson 1957:53-57).

Danson observed a greater mix of Mogollon/Mimbres and San Juan Anasazi traits in the Quemado area than further south in the Mimbres area (Danson 1957:101). He labeled the northern area the Alpine branch and described the pithouse sites as containing a mix of brown and white wares, predominantly local brown wares. Some of the three-to-four-room boulder-masonry or jacal pueblos that followed also had pit structures. These small sites were followed by Reserve phase sites characterized by boulder-masonry pueblos, often with a court or plaza. Reserve series ceramics occurred with northern wares such as Escavada, Puerco, and Gallup Black-on-white and Wingate Black-on-red. Danson suggests some expansion southward into areas previously occupied by Mimbres groups during the Reserve phase. The Tularosa phase was represented by large multiroom pueblos with enclosed plazas. Tularosa series ceramics were typical, and intrusive wares include late Puerco, Chaco, and Socorro Black-on-white, Wingate and Puerco Black-on-red, and St. Johns Polychrome. Toward the end of the phase, the population markedly declined, and only a few sites continued to be occupied.

In 1951 the Peabody Museum undertook the excavation of the Williams site, on the east side of Largo Creek at an elevation of 2,170 m and 9 km south of Quemado. The site had two occupations, the earlier one consisted of at least six shallow pit structures and a large saucer-shaped excavation. The structures were circular, varying in detail and depth. The later occupation included jacal and masonry rooms constructed in the same area and overlying the earlier structures. Masonry consisted of boulders of varying sizes, and the upper walls may have been jacal. Of the nine rooms, two were isolated, and the rest were in clusters of three and four rooms (Smith 1973:1-2).

Further north, the Cerro Colorado site was excavated in 1953 and 1954. Located 12.9 km north of Quemado at an elevation of 2,255 m, the site was a pithouse village with a Pueblo II reoccupation. Brown wares generally comprised 5 to 10 percent of the earlier ceramic assemblage, although in one structure (201A), 80 percent of the ceramics were Mogollon wares (Bullard 1962:11).

The Peabody Museum also excavated on Mariana Mesa from 1949 through 1951 (McGimsey 1980), northwest of Quemado. Mariana Mesa ranges from 2,100 to 2,300 m in elevations. Seven sites, dating between A.D. 850 to 1300, were excavated.

Coal Lease Area

Recent projects associated with the Fence Lake Coal Lease (Hogan 1985, 1987) and the San Augustine Coal Area (SACA) (Camilli et. al. 1988; Kayser and Carrol 1988), just north of Quemado, provide comparative information on site and ceramic distributions. The SACA stratified survey covered approximately 10 percent of an area of 448,920 acres and just over 500 sites (Camilli et. al. 1988:1-1, 4-9; Kayser and Carrol 1988:7-1). Camilli and colleagues indicate that the majority of the sites are Pueblo II and Pueblo III. Pueblo I-II sites were observed in clusters at the bases of mesas and on low ridges, especially between tributaries. Pueblo II and later sites were predominately on ridges at the upper reaches of water courses (Kayser and Carrol 1988:4-11).

At Fence Lake, immediately south of SACA, over 8,480 acres were surveyed and 223 sites located. Dividing the Pueblo occupation into four periods, a number of changes in settlement type and location were observed. Period 1 (A.D. 950-1050) sites are almost always seasonally used sites near field areas and probably representing an extensive agricultural strategy employing the use of several field locations in different topographic situations. Period 2 (A.D. 1050-1125) is represented by a few small permanent residences that probably represent largely self-sufficient family units. Seasonal-use sites continued to be numerous and suggest continuation of a strategy of extensive farming in small catchments. Period 3 (A.D. 1100-1175) had the largest population, represented by large habitation structures and hamlets. Fewer day-use and fieldhouse sites were found, suggesting a change to concentrated labor at the more productive field locations. Period 4 (A.D. 1150-1200) exhibited a marked decease in the number of sites and the few found are small habitation or ephemeral fieldhouses. Large sites from this period have been recorded north and northeast of the area, suggesting a shift in population (Hogan 1985:200-207).

Museum of New Mexico

In addition to the Castle Rock portion of NM 32, the Laboratory of Anthropology conducted work along two other segments--the Armijo Springs project (Kayser 1972a) and the Whiskey Creek project (Kayser 1972b), an after-hours survey along Apache Creek (Wiseman and Kayser n.d.), and a right-of-way for the USDA Forest Service a few miles east of NM 32 (Kayser 1975).

The Armijo Springs project investigated 10 sites. Seven were primarily lithic scatters, two were small fieldhouses, and the other was a portion of a large multicomponent site dating between A.D. 1150 and 1300. Six rooms of the 100 room pueblo lay within the right-of-way and were excavated.

In addition, at this same site, a four-room hillside pueblo dating between A.D. 1075 and 1150 and five rooms dating between A.D. 1000 and 1075 were excavated. Other than maps, little information was provided in the nine-page report (Kayser 1972a).

The Whiskey Creek project (Kayser 1972b) included excavations at 13 sites. Structures investigated included two Pine Lawn phase pit structures, two Three Circle phase pit structures, 11 Reserve phase rooms, three Apache Creek phase pit structures, and Tularosa phase structures at four sites. Maps are provided for many of the structures as well as locational information.

Wiseman and Kayser conducted an after-hours survey along Upper Apache Creek Valley and its branch canyons in order to provide additional information to settlement patterns. The survey area was restricted to valley benches and slopes within 30 m of the valley floor. A total of 42 sites were recorded in less than 6.5 km. Only one of the sites had more than 15 rooms. The sites include 9 fieldhouses, 10 pueblos with pit structure depressions, 13 without pit structure depressions, 3 pithouse villages, 4 sherd and lithic scatters, 3 lithic scatters, 4 caves and rockshelters, and 1 rock art site. The authors concluded that the population in the upper reaches of the creek was small and scattered, and most of the sites postdate A.D. 900.

The Gallita Springs excavation report (Kayser 1975) provides more information than the previous ones. Twelve areas were excavated or tested on a *rincon* slope overlooking Gallita Springs. Investigations at the largest site included excavations of 30 structures, hearths, and a storage pit.

The museum projects provide very little in the way of comparative information. Criteria for dating structures is never revealed, and the assessments are difficult to take at face value. This renders the entire base useful only for the few architectural observations that can be made from site maps.

CULTURE HISTORY

The Mogollon Culture is believed to have developed from the Cochise Culture. Martin (1979:62) considers the Cochise a local adaptation of the Desert Culture, which goes back to at least 5000-6000 B.C. The Cochise Culture is divided into stages. The Sulphur Springs phase, dating from B.C. 9000 to 7000-6000, is associated with extinct megafauna. Little is known of the period between the Sulphur Springs phase and the Chiricahua phase of 3500 to 1000 B.C. Tool kits from Chiricahua phase sites suggest a mixed foraging economy. Base camp and special-activity sites have been found. The succeeding San Pedro phase lasted until circa A.D. 1 (Irwin-Williams 1979:32-41).

Hogan reports 59 probable "Archaic" components and 30 lithic scatters of unknown date from the Fence Lake survey. *Hunting* or *hunting-related* were the most common site types and suggest sporadic use of the area by groups based elsewhere (Hogan 1985:39-40). Archaic sites tend to cluster on upland slopes with piñons and junipers. Hunting sites are on low ridges overlooking drainages in the east and central portion of the lease area and on low eminences within the flood plain in the southern part of the lease. Hunting focused on deer in the east and central areas and pronghorn or bison to the south. The few residential sites are generally on upland slopes within the piñon-juniper zone, and a few occur in lowland areas adjacent to floodplains (Hogan 1985:197).

A simplified chronology is used throughout this report, largely because of imprecise dating of the sites and the associated ceramic types. Table 2 gives an approximation of the dates involved and the equivalent Pine Lawn area phases (adapted from Anyon 1984; Berman 1979; and LeBlanc and Whalen 1980).

In his discussion of Mogollon settlement patterns in New Mexico, Anyon describes Early Pithouse period sites as villages of one to 60 structures predominately on high knolls overlooking perennial rivers or agricultural lands. Late Pithouse period sites are described as similar in the number of structures but located on first river terraces or edges of meadows and near good agricultural lands. While location of sites is similar during this period, Anyon notes that northern sites appear to have had shorter periods of occupation, relocating to new locations in similar settings. In the Mimbres area, settlements were occupied during each phase, and superimposition of structures is more common than in the northern area. Areal differences are even greater during the Pueblo periods. In the northern part, the pattern is one of dispersed 1 to 20 room pueblos scattered around a communal structure (Anyon 1984:29-37).

Similar patterns are described throughout the Mogollon literature (Berman 1979; Bluhm 1960; LeBlanc and Whalen 1980; Martin 1979; Minnis 1985; Nelson 1980; Peterson 1988). Various explanations have been offered for elevated locations of the Early Pithouse sites: defense from hunting and gathering groups (LeBlanc and Whalen 1980; Martin 1979:65-66; Martin and Plog 1973); the superiority of elevated areas for a mixed subsistence pattern (Bluhm 1960:541); or environmental considerations (Berman 1979:30; Wheat 1955:35). Hunter-Anderson (1980:50-51) expects that the initial attempts to supplement hunting and gathering with horticulture should be found at higher elevations, where moisture is greater and labor investment less, and where the activity is closer to winter camps and nut-gathering areas. Matson, on the other hand, feels that early maize would have been initially grown in areas similar to those the plants were adapted to, that is, low elevations where floodwater farming is feasible. High-elevation farming would be possible only after maize had been genetically adapted to early drought, cold nights, longer days, and biseasonal moisture regimes (Matson 1991:212).

Movement to lower terraces in the Late Pithouse period has been explained variously: defensive locations were no longer needed (Martin 1979:66); a greater dependence on agriculture caused movement to areas near field locations (Bluhm 1960:542); or the filling of the mountain niches forced a shift to lower locations and an increase in labor investment (Hunter-Anderson 1980:52).

Focusing on the advent of surface structures and black-on-white pottery, manifestations of the Early Pueblo period have been described as a shift from standard Mogollon technological patterns to one strongly influence by Anasazi patterns (Bussey 1982) or the results of Anasazi migration into the area (Bluhm 1960:543). Alternative explanations view the increasing utilization of marginal areas, agricultural intensification, and use of more wild foods as adaptive responses to population increase (Nelson 1980:9-14) or a response to climate change (Stuart and Farwell 1983:155).

Berman describes the distribution of Early Pueblo period sites as indicating an extensive expansion into unoccupied or sparsely occupied areas. Sites are often found on terraces and benches of drainages, but also occur on low-lying mesas, hillsides, and valley floors. The greatest density of sites in forested areas is between the Upper Sonoran and Transitional zones (Berman 1979:46-47). Late Pueblo period sites are fewer in number and larger. Consolidation took place ca. A.D. 1200. Sites are situated on benches, terraces, edges and bluffs, or at the margins of basins (Berman 1979:57-79).

Danson (1957:104) dates the abandonment of the Gallo area at around A.D. 1250. Berman (1979:60) suggests that sites located at high elevations in narrow alluvial valleys were more likely to be abandoned than those at lower elevations.

The Gallo Area

The settlement pattern described by Danson (1957) for the Largo and Agua Fria Creek areas is consistent with that for the Mogollon in general. A close look at the survey and excavation information from the project area supports some of the generalities (Table 3). Given that the right-of-way is a very limited and nonrepresentative sample of the area, and that surface observations were found to be very poor indicators of subsurface remains, the survey observations must be viewed with reservations.

Three Pithouse period residential sites and a campsite were found. None of the residential sites were in the conventional location for Early Pithouse period sites, that is, high and isolated knolls. The excavated residential site, LA 5407, was located by survey only because an arroyo cut through two of the structures. These sites are near agricultural land in situations more characteristic of the Late Pithouse period. Ethnobotanical remains suggest a heavy reliance on stored domestic crops. Corn, beans, and squash were all found within one burned structure. The faunal assemblage contains some species more typical of flat areas, suggesting that a portion of the group remained relatively mobile.

No Late Pithouse period sites were identified as such by the surveyors, possibly due to the limited nature of the survey and the same alluvial processes that obscured LA 5407. However, while Alma Plain and San Francisco Red ceramics were found at many of the excavated sites, very few red-on-brown or other wares typical of the Late Pithouse period were recovered. This suggests the period is not well represented in the area, and there may have been a break in the occupation of Largo Valley.

The large number of Early Pueblo period sites confirms general observations of a population expansion and increase. Sites are small. The largest may have 20 rooms. These sites may or may not cluster around a ceremonial structure. None was reported for this period, but the limited nature of the survey leaves open the possibility. Residential sites are located on hillsides or ridges near, but not on, land that could be used for crops. The majority of the fieldhouse sites appear to date to this period, as may the water-control features. Similarly, the presence of one large Late Pueblo period or Tularosa phase site is consistent with aggregations found at Fence Lake to the north (Hogan 1985) and with Danson's (1957) observations. The majority of the excavated Early Pueblo period sites contain ceramic wares dating to this period and suggest continued use of the smaller residential sites.

Residential sites are located where the right-of-way parallels Largo Creek in a relatively broad portion of the valley and across from two large rincons. A seep 250 m east of LA 14884 may have contributed to the concentration. Fieldhouse sites are scattered along the creek and continue past the narrowing of the valley. Water-control features are concentrated where the valley is narrow with steep sides. A few water-control features are also located at or near the residential sites. Scatters and campsites tend to be at higher elevations and further from the creek (Table 4).

Residential sites tend to be farther from the creek than fieldhouses (mean 225 m and 67 m) and are at lower elevations (2,219 and 2,227 m). The higher elevation of fieldhouses is somewhat inconsistent with expectations, but half of these sites are to the south of the residential sites, and thus farther into the mountains. The survey information on distance from arable land is inconsistent and probably unreliable.

LA 5407 (QUEMADO ALEGRE)

LA 5407 is situated on a level terrace between two deep arroyos 200 m east of Largo Creek at an elevation of 2,225 m (Kayser 1973:14). Vegetation consists of a dense growth of piñon, juniper, and grasses. The nearest arable land is in the valley bottom, 100 m to the west.

The site was first recorded during the March 1972 survey of the NM 32 right-of-way. Two pit structures and a trash lens were observed eroding out in an arroyo. Excavation that summer (the Castle Rock project, or CR) exposed three pit structures, four bell-shaped storage pits, an unlined hearth, and a pile of river cobbles that may represent a cache of lithic materials (Kayser 1973:14-17).

The first pit structure (CR Feature 9), which was bisected by an arroyo, measured 5.21 m north to south and 5.0 m east to west. The floor was 1.0 m below modern ground surface but was excavated only about 0.1 m into the prehistoric ground surface. The structure had a rock-rimmed, unlined circular hearth, a storage pit, a bell-shaped pit, and 14 perimeter postholes. On the floor were five smashed vessels, four fire-cracked metates, two whole and two partial manos, a paint grinding slab, lithic artifacts, and sherds. Two of the vessels were unfired with vegetal temper. The exteriors were basket impressed and the interiors smoothed. The remaining vessels were an early variety of Alma Plain (Kayser 1973:14).

The second pit structure (CR Feature 12), which measured 7.8 m north to south and 5.8 m east to west, was better preserved. The floor was 1.34 m below the modern ground surface. Floor features include an unlined clay rimmed basin hearth, a small sealed bell-shaped pit below the hearth, three shallow storage pits, and 9 interior and 26 peripheral postholes. On the floor were two partial Alma Plain vessels, five manos, two metates, two mauls, an axe, a paint slab, stone tools, a shell bracelet and bead, and a large fragment of a charred "human hair" skirt. Charred beans, corn, and gourd fragments were also recovered. In the fill were a number of burned logs with shorter logs at right angles. Three of these dated HWS-26 - 313p-472++B; HWS-33 - 351p-475++B; and HWS-27 -344p-484++B, indicating construction in the late A.D. 400s (Kayser 1973:14-15).

The third structure (CR Feature 21) was poorly preserved. The floor was 1.25 m below the modern ground surface, and it had no features. Charred corn kernels, Alma Plain sherds, flakes, and a projectile point fragment were found on the floor (Kayser 1973:15).

The exterior bell-shaped pits ranged from 0.6 to 1.5 m in diameter at the mouth and up to 2.5 m at the base. These were usually unplastered and contained some trash. CR Feature 23, measuring 1.52 m deep, 1.5 m in diameter at the mouth, and 2.5 m maximum diameter, was completely filled with charred corn kernels in a small amount of sandy soil. An exterior firepit (CR Feature 13) was unlined and unshaped. Its depth, 30 cm below ground surface and 20 cm above the floor of CR Feature 12, imply that it postdates other features at the site (Kayser 1973:16).

General Methods

Although some deep trenching was carried out in 1972, the tests were north and east of the features reported here. During the spring of 1977, a highway contractor blading an access road within the right-of-way uncovered an extensive charcoal stain. The Laboratory of Anthropology returned and spent three weeks excavating a large pit structure and its associated features.

The Gallo project excavations began with the removal of trees and brush by a bulldozer. Loose soil was removed in horizontal layers 2 to 5 cm centimeters thick. Archaeologists checked for artifacts between passes. Auger testing revealed deep pockets of charcoal-stained soil and located a 4 m diameter stained area, a 2 to 3 m diameter stained area, and three smaller stained areas.

A 50 m long east-west base line was established roughly perpendicular to the right-of-way fence. North and south measurements were taken from the line (Fig. 2). Features 1 through 24 were established as 2 by 30 m strips.

Five backhoe trenches placed in the southern portion of the site located no major cultural features. An additional backhoe trench, which bisected the base line, located dark ash at 10 to 30 cm below ground surface. The remaining trenches were hand excavated in 15 cm levels. Except in areas of dense trash, fill was not screened.

Much of the overburden, which was fairly uniform across the site, was removed by bulldozer or road grader. The upper 10 cm consisted of pine duff, grasses, and eolian sand. Below this and extending as deep as 60 cm was a layer of redeposited volcanic ash and clay mixed with sand and occasionally gravel. Some charcoal was observed in the lower levels.

Feature Descriptions

The Structure

The first indication of a structure was an occupation layer and postholes located 70 cm below ground surface in Feature 6 (Figs. 3 and 4). Overburden was removed without screening and with the help of a backhoe. Burned perimeter posts delimited the 4 m diameter antechamber (Feature 25).

The excavators noted a heavy trash concentration continuing to the south and suspected another chamber. This overburden was removed mechanically. A trench extending south and east from the center revealed a main chamber 8 to 9 in diameter (Feature 39). Once the perimeter was defined, the main chamber was divided into quadrants for artifact recovery. Floor artifacts were measured in distance and degree from a center point.

Fill. Feature 6 overburden overlying the structure consisted of 50 cm of volcanic ash and clay with sand, charcoal, and a few fire-cracked rocks. Beneath this, dark stained layers alternated with thinner and lighter colored lenses of water-laid clay. Although rich in cultural material, the upper fill was considered sheet trash and removed without screening or by mechanical equipment.

Fill within the antechamber was removed by grid in 5 to 15 cm levels and screened. The fill from 70 to 90 cm deep consisted of charcoal, fired clay, ash, and burned rock in a darkly stained sandy volcanic soil. A concentration of artifacts, particularly obsidian, was found above the roofing materials. Remains of numerous charred posts and beams were found 10 cm above the floor (Fig. 5). Beneath the posts were smashed vessels, all early varieties of Alma Plain. Some vessels were slightly above the floor, suggesting to the excavators that they could have been suspended from

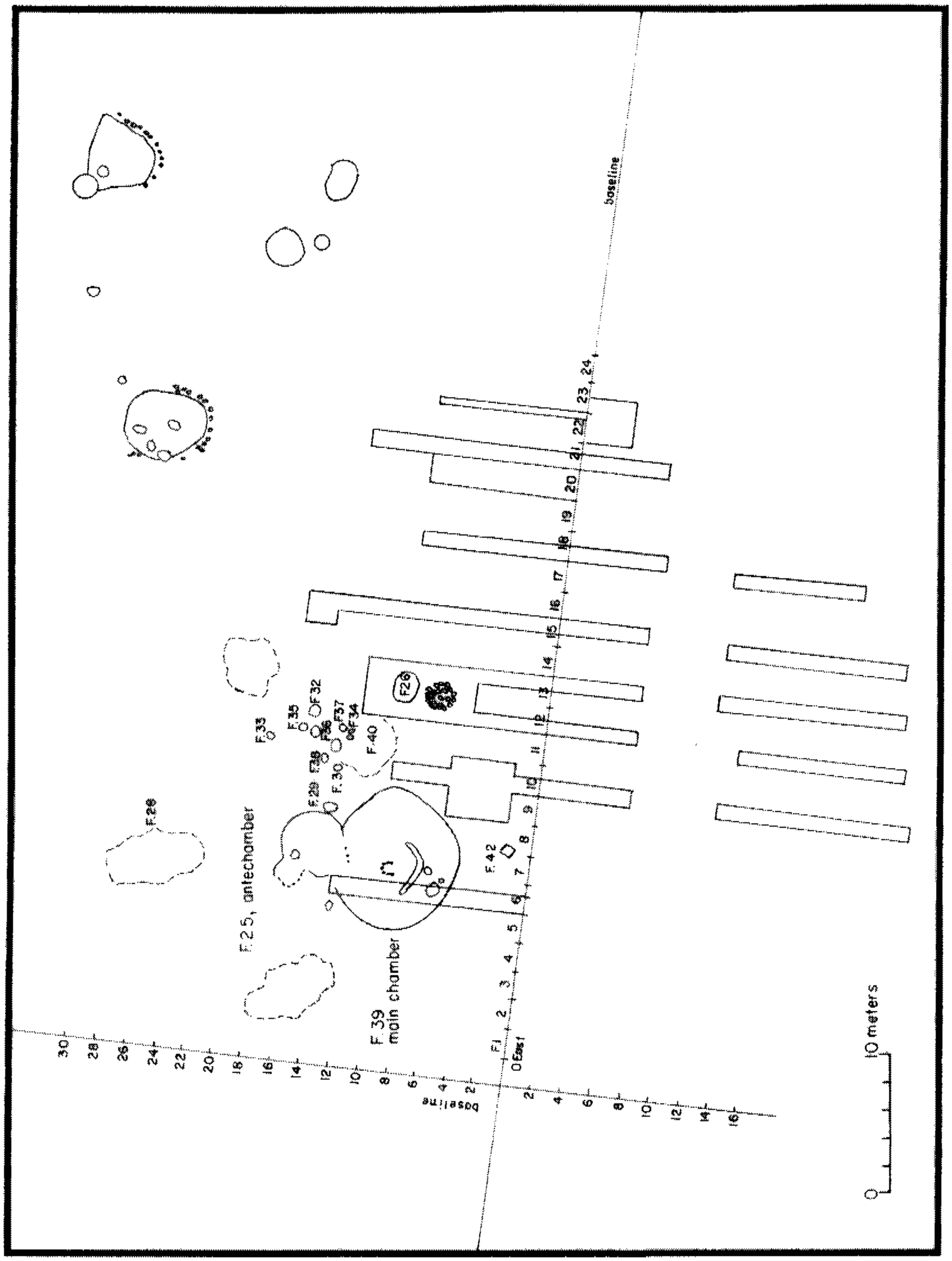

Figure 2. LA 5407 site map.

roof beams. Floor fill was a heavy concentration of cultural material in sand and roof fall. The floor at 1.45 to 1.51 m below ground surface, was uneven compacted native earth. It was very hard, lighter in color than the fill, and had less charcoal.

Within the main chamber, fill was dense trash in a heavily burned matrix, chunks of fired earth, and pine needles. Burned beams from the walls and roof crossed 15 to 20 cm above a hard-packed and heavily burned sandy floor. Burned roofing materials tended to occur outside the central posts (Figs. 6 and 7).

The general fill, down to 15 cm above the floor, was removed as a unit, and only the lower 15 cm was screened. Floor fill artifacts (Fig. 8) were collected by inner and outer zones with vertical control. The inner zone had a 2.5 m radius. The outer zone consisted of the concentration of burned logs oriented toward the interior of the chamber. Four dendrochronological samples from the antechamber and 12 from the main chamber suggest construction after A.D. 520 (Table 5).

The excavators felt there was little roof fall in either chamber and surmised that the structure was either incomplete and had only a clay and twig covering or that portions of the roof could be removed during the warm season. The former seems unlikely given the number of features, including some that were sealed.

The structure had burned. Roofing material and almost all floor materials were charred, and some of the obsidian was fused, indicating a very hot fire. Correspondence concerning the structure states that the excavators felt the residents had been forced to flee by a forest fire.

Antechamber architecture. The antechamber (Feature 25) was irregular in shape (see Fig. 3). The eastern half approximates a half circle, but the west was formed by a number of rounded angles. Entry was through a hall-like area in the northernmost portion of the west side. The entryway was 1.0 m wide and lined by postholes 9 and 13 cm in diameter. There was a 12 cm step down from the prehistoric ground surface into the antechamber. The floor was uneven and hard with concentrations of charcoal. An early test square in the structure fill identified three floor surfaces at 1.51, 1.54, and 1.56 m below ground surface. Subsequent notes do not mention more than one floor.

The postholes indicate a combination of diagonal and vertical upright roof supports. Diagonal posts were located at the intersection of the floor and walls, predominantly along the north and east, and were angled toward the center of the antechamber. Postholes for the diagonal posts average 9.76 cm in diameter (Table 6). The west and north edges were lined by vertical posts averaging 10.92 cm in diameter. Large interior postholes average 14.6 cm in diameter and small verticals between the chambers average 12.6 cm in diameter. Some of the latter were covered with the original plaster.

Evidence of roofing consisted of fired and impressed clay, burned beams, and grass matting in the northwest quad. The fired clay appeared to be mostly from the walls. Layers of pink and white clay were found around the burned posts. The burned posts found in the fill measured between 6.5 and 14 cm in diameter.

The feature form indicates that the antechamber measured 3.95 m east to west to the inside posts and 4.2 m to the outside postholes. North to south it measured 4.45 m outside the postholes. Using these measurements, the antechamber is approximately 18 sq m. Inside the antechamber was

Figure 3. Structure, LA 5407.

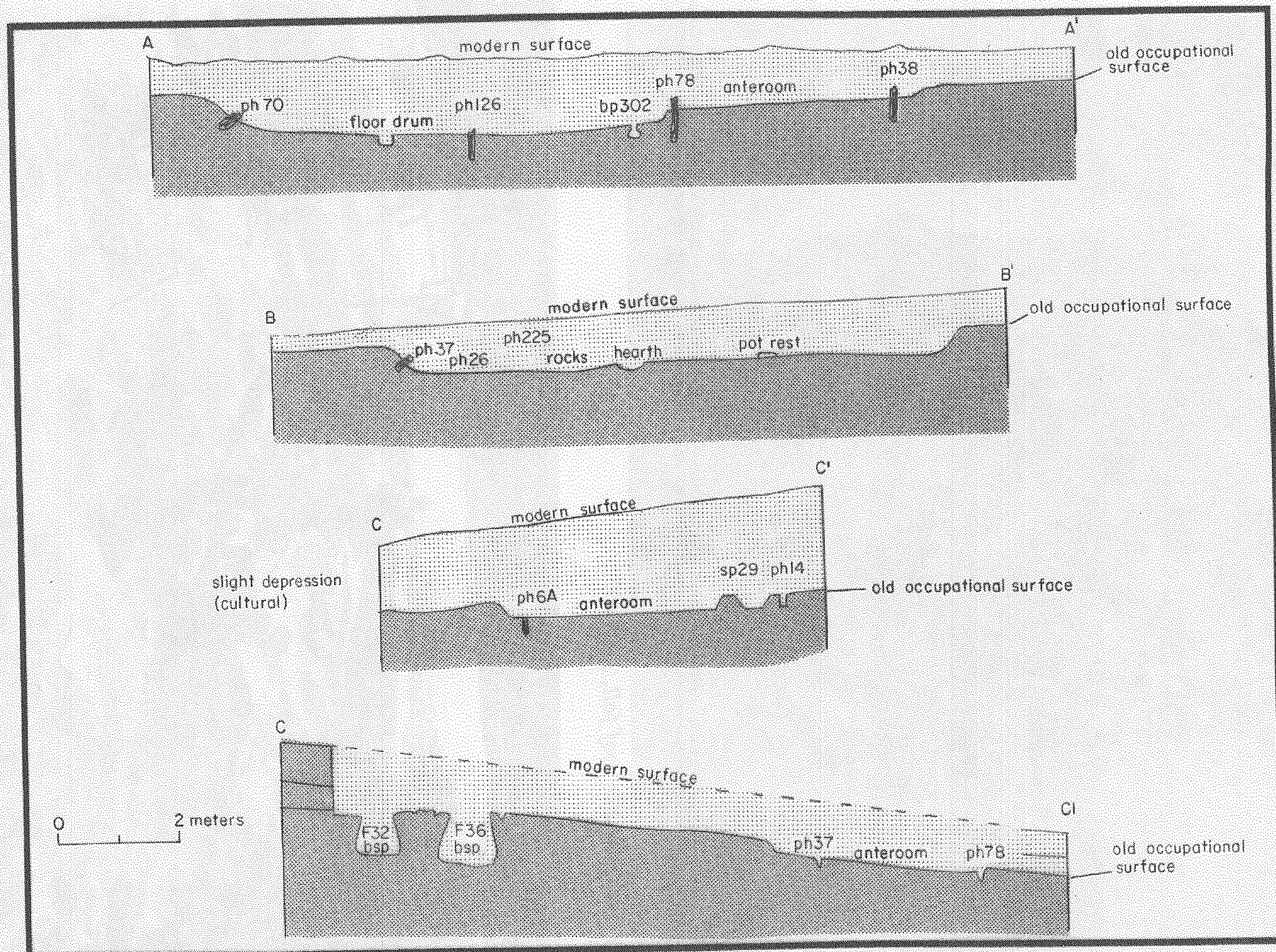

Figure 4. Profiles of structure, LA 5407.

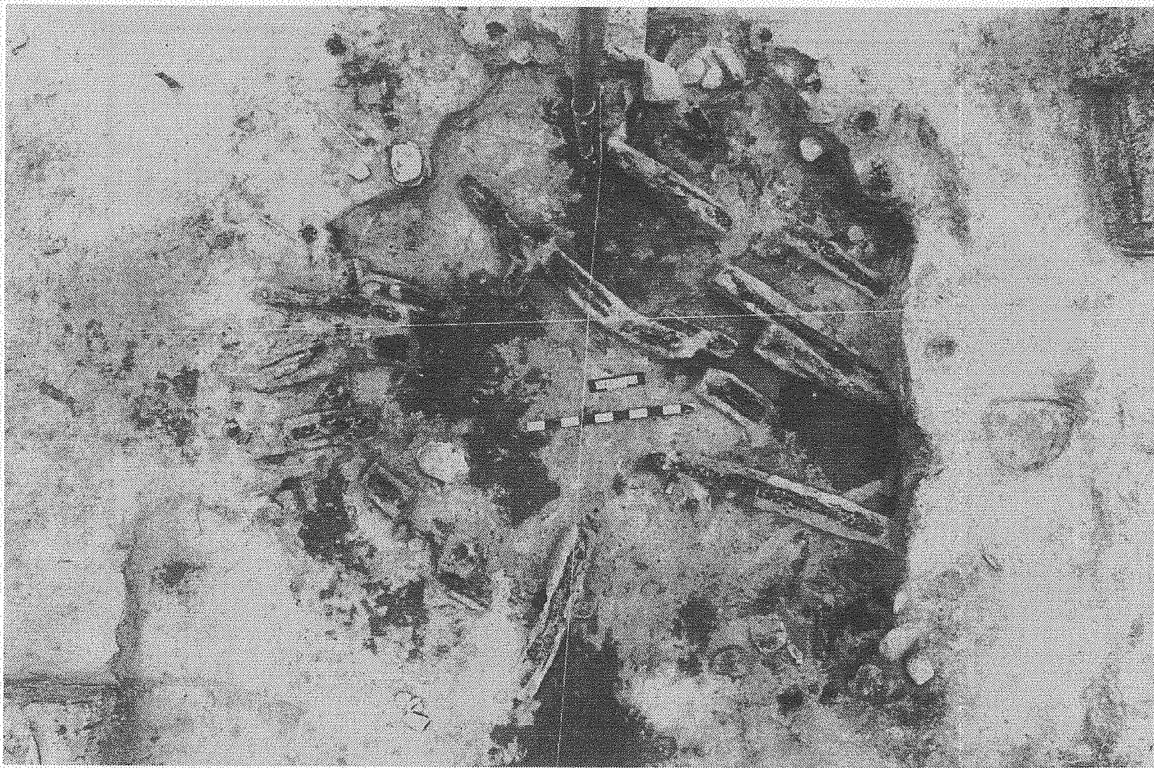

Figure 5. Antechamber roof fall, LA 5407.

Figure 6. Main chamber wall or roof beams, LA 5407.

Figure 7. Main chamber logs in situ, LA 5407.

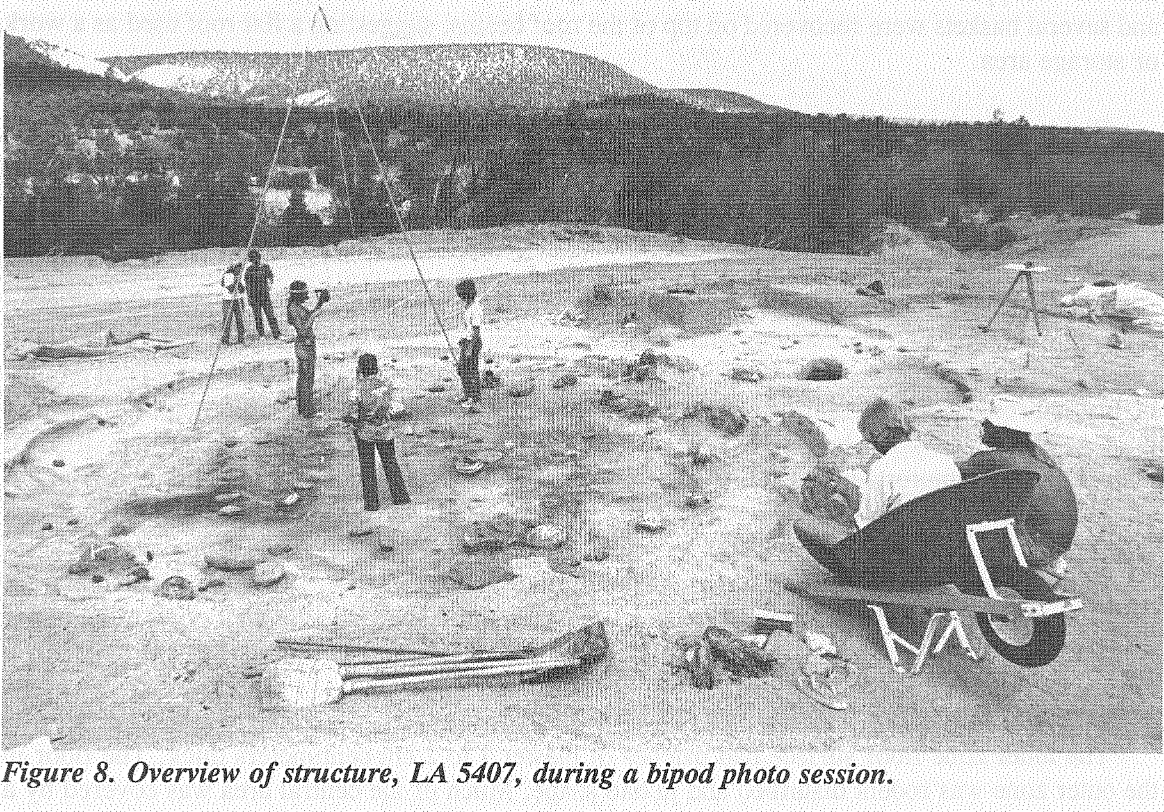

Figure 8. Overview of structure, LA 5407, during a bipod photo session.

a single bell-shaped pit (Feature 34) measuring 50 to 55 cm at the top, 105 to 108 cm at the bottom, and 80 cm deep. Fill was sandy with moderate amounts of charcoal. Two thin clay layers were observed near the top, and a pocket of corn cobs and loose corn was mixed in the fill. A small boulder rested on the top and may have served as a plug.

Main chamber architecture. Entry into the main chamber was through a 58 cm wide opening in the southwest corner of the antechamber. The edge of the 12.5 cm step down was rock lined. The main chamber is roughly circular and measures 8.4 m northwest to southeast, 8.25 m northeast to southwest from the diagonal poles, 9.05 m east to west, 7.2 m from the poles separating the chambers to the north wall, and 9.0 m from the northwest to the southeast upright posts, for an area of approximately 73 sq m.

Diagonal posts, located at the intersection of the wall and the floor, rimmed most of the exterior. There are, however, gaps of 1.0 to 1.5 m between groups of diagonals. The posts were angled toward the center of the structure and undoubtedly rested on a framework built on large interior upright posts. The diagonal postholes average 11.07 cm in diameter (Table 6), slightly larger than the antechamber diagonal postholes. The interior vertical postholes were considerably larger than those in the antechamber, averaging 22.67 cm in diameter.

The outer ring of postholes was at the level of the prehistoric ground surface. These vertical posts average 9.56 cm in diameter. Like the diagonals, there were several large gaps around the perimeter. It is difficult to say what function these outer posts served. Most are less than 20 cm from the wall of the structure and could have served to hold roofing material in place or as additional supports for main roof beams radiating out from a central support system. Six metates and several baskets were recovered on top of the roof beams, suggesting a flat roof used as a work or storage area.

Field notes (Kayser, August 3, 1977) suggest the structure walls were composed of small-diameter poles inserted in the diagonal postholes at the base of the walls and covered with interwoven willow and pine twigs, matted grass and bark, all covered by clayey soil. Rocks along the inner perimeter were thought to indicate a rock coping along the wall base.

The few beam impressions collected (n=19) indicate poles ranging from 2.9 to 6.0 cm (mean 5.07 cm, sd 1.26, n=8) in diameter and suggest selection for poles measuring between 5.6 and 6.0 cm. Impressions of juniper bark or splints, parallel to the beam impressions, were observed on nine of the impressions. Irregularities in two of the impressions suggest that the beams were also juniper. One impression had a reed or cornlike stalk impression perpendicular to the strips of juniper barklike impressions. A flat-surfaced impression also had striae reminiscent of corn husks. There was no evidence of interwoven willow or pine twigs in the specimens collected.

Burned wood from the fill of the central portion of the structure suggest that piñon logs were used for crossbeams. Juniper may have been used as main beams and side wall poles. The major concentration of burned logs was outside the main post supports and burned logs were oriented toward the interior.

The inner zone floor surface had patches of plaster 1 to 2 cm centimeters thick. The floor in the outer zone was rodent disturbed and in bad shape. Much of the central area was covered by a few centimeters of hard-fired earth with vegetal impressions, which the investigators suggested were the remains of floor-anchored screens.

Few of the numerous floor features were described by the excavators (Figs. 9 and 10). The hearth, slightly off center, measured 95 cm north to south, 80 cm east to west, and 14 cm deep. It was roughly circular, with rocks lining the northern half. The fill consisted of 6 cm of ash over 1 cm of sand, 2 cm of ash, then 5 cm of brown volcanic-type soil with light charcoal at the bottom. There was little evidence of use.

A shallow U-shaped trench 25 to 30 cm wide except at the bend, where it was 40 cm wide, was labeled a foot drum. Fill consisted of trash, sand, gravel, and clay. Pieces of wooden planks were found at 10 cm below the floor level. The bottom of the resonator was 15 cm below the floor level. A rock-filled pit just south of the foot drum measured 53 by 55 cm and 26 cm deep. It was lined with eight large stones, and the fill consisted of dark brown earth and charcoal.

Two of the bell-shaped pits were described. Pit 216, a small bell-shaped pit in the northeast quadrant, measured 20.5 to 25.0 cm at the top, 32 to 38 cm at the bottom, and 30 cm deep. Fill was a volcanic ash and clay. Pit 222, a large bell-shaped pit in the southwest quadrant, was 80 cm in diameter at the top, 90 cm in diameter at the bottom, and 95 cm deep. Fill was sand mixed with charcoal and trash--including a metate and a polishing stone. Pit 222, found when stripping away the floor, had a main and a secondary posthole in its fill.

Most of the postholes were measured; however, the remaining features were not described. There is reference to slots, storage pits, pot rests, small bell-shaped pits, a hearth screen, a large screen south of the hearth, and the possibility of a raised wooden floor in the southwest quadrant. There are no descriptions, and few features are specifically identified on the map. Nor are there indications of whether most of the features were associated with the last occupation of the structure. The floor was removed in at least the northeast and southwest quadrants, and at least two of the small bell-shaped pits (301 and 302) and Pit 222 were sealed.

Feature 29

Adjacent to the east edge of the antechamber is Feature 29, a shallow basin pit surrounded by posts. The feature may have been accessed through the antechamber, or it may have been within a jacal structure adjacent to the structure. Thirteen small upright posts (postholes averaging 6.92 cm in diameter) surround the pit. The pit was 40 cm deep and measured 74.0 by 98.5 cm at the top and 50 by 55 cm at the base. Fill was mostly sand with some charcoal and clay. The posthole pattern suggests a roof or even a crib for additional storage.

West of the intersection of the antechamber and main chamber was another pit surrounded by postholes averaging 10.2 cm in diameter. From the map, it appears that the area was part of the structure, but there are no notes to confirm that it was.

Feature 26

East of the structure, 23 to 25 m east and 6.0 to 8.5 m north, was a pile of cobbles 1.5 m in diameter, 0.15 m thick, and 0.35 m below the present ground surface. The rock ranged from small pieces to large boulders. Some of the smaller rocks were fractured. Fill within the pile consisted of fired earth on a sandstone deposit. To the north at 22 to 26 m east and nine to 10.0 m north was a rock-filled pit (Fig. 11). The uppermost layer of rock was burned and charcoal stained; the lower rocks were not. At 40 cm below ground surface, a thick layer of yellow to deep orange fired earth

Figure 9. Feature 39 after excavation, LA 5407.

Figure 10. Features 25 and 39 after excavation, LA 5407.

overlaid a layer of burned earth. The fill was heavily burned and stained soil and fire-cracked rock. The excavators suggest an intense fire, possible a kiln or oven. A nearby area of burned clay and sandy chunks of clay may have been associated with the feature.

Figure 11. Feature 26, LA 5407.

Feature 27 and Associated Pits

An occupational surface with a number of associated features was located east of the antechamber (12 to 16 m north, 18 to 22 m east). Between 45 and 60 cm below the surface was a layer of heavy charcoal, ash, and trash. A concentrate of trash at 12 to 14 north and 18 to 19 east was designated Feature 40. In the area were three bell-shaped pits (Features 30, 32, and 36), storage pits (Features 33, 35, 37, and 38), two small shallow pits possibly used for adobe mixing, and a number of postholes. Table 7 summarizes the dimensions and fill of these features. Two of the bell-shaped pits were surrounded by postholes, suggesting roofs or granaries. A series of postholes and a line of rock between the pits and the antechamber may represent a brush or jacal wall.

Feature 28

Feature 28 was an area of stained earth, possibly a trash area. It was located 12 to 16 m east and 22 to 30 m north. Fill was a 15 cm thick layer of charcoal and ash dumped over sandy, volcanic, and clayey soils.

Feature 42 (Dog Burial)

A skeleton of an immature dog was found 2.5 m south of Feature 29 at 82 to 92 cm below ground surface. The dog was flexed and had three sherds and a flake under the chest.

Cultural Material

Ceramic Wares, by Rosemary Talley

The ceramic complex from LA 5407 shows it to be a brown ware site, representative of the Early Pithouse period or Pine Lawn phase of the Mogollon. Approximately 18 vessels were recovered, and a large number of sherds could be associated with partial vessels (Figs. 12-19).

Almost all of the sherds could be identified as the Pine Lawn Plain wares described by Haury (1936), Martin (1940, 1943), and Nesbitt (1938). Five types of plain wares were found: Alma Plain, Alma Rough or Mogollon Brown, Alma Smudged, San Francisco Red, and San Francisco Red, Smudged. Four painted or textured types were recovered at LA 5407. One sherd each of Tularosa Patterned Corrugated, Tularosa Black-on-white, Reserve/Tularosa Black-on-white, and Wingate Black-on red were collected. These are presumed to be intrusive, and their origin may have been two sites adjacent to LA 5407.

Alma Plain

The most characteristic and ubiquitous pottery among the Mogollon ceramics is a plain brown ware that existed with very little change from the earliest to the latest horizons and has come to be called Alma Plain (Smith 1973). The bulk of the ceramic material from LA 5407 is the stone-polished variety of Alma Plain common to other sites of this time period (Wheat 1955:77). Stone polishing over leather-hard clay is a principle attribute of the Alma Plain and San Francisco Red wares from the site. The polishing marks show no evidence of causing "temper drag" and appear horizontally and vertically or in combination on the vessel surface. Although no slip was used, both surfaces of bowls and exterior jars were well polished. Surface undulation or "dimpling" is common, and occasionally the coils are not completely obliterated. Jar interiors are scraped to a very even surface.

Paste is granular but not friable. Sherds "snap" when broken and fracture with straight edges. The color of both surface and paste varied widely partially because of uneven firing and partly because of smoking or partial reduction during use. Furthermore, the ceramics were subjected to a secondary firing when the pit structure was burned. The LA 5407 Alma Plain does not exhibit the yellow casts often found but does show some dark gray and brown-black.

Because of the burning, some of the attributes may be misleading. Fire clouding is common on many of the vessels. The rosy to orange color, particularly evident in the seed jars, may occur as a result of secondary firing. The "basket liners" have been fired, but it cannot be determined whether this was an intentional primary firing or the subsequent accidental firing.

The temper appears as rounded and subangular sand grains (Powers roundness scale). Helen Warren (personal communication, 1977) identified volcanic ash as a primary component within the temper. In comparison, Haury (1936:32) described the Alma Plain from Mogollon and Harris

Figure 12. Alma Plain ceramic vessels, LA 5407: top, Vessel 14 (FS 39-791); bottom, Vessel 13 (FS 39-794).

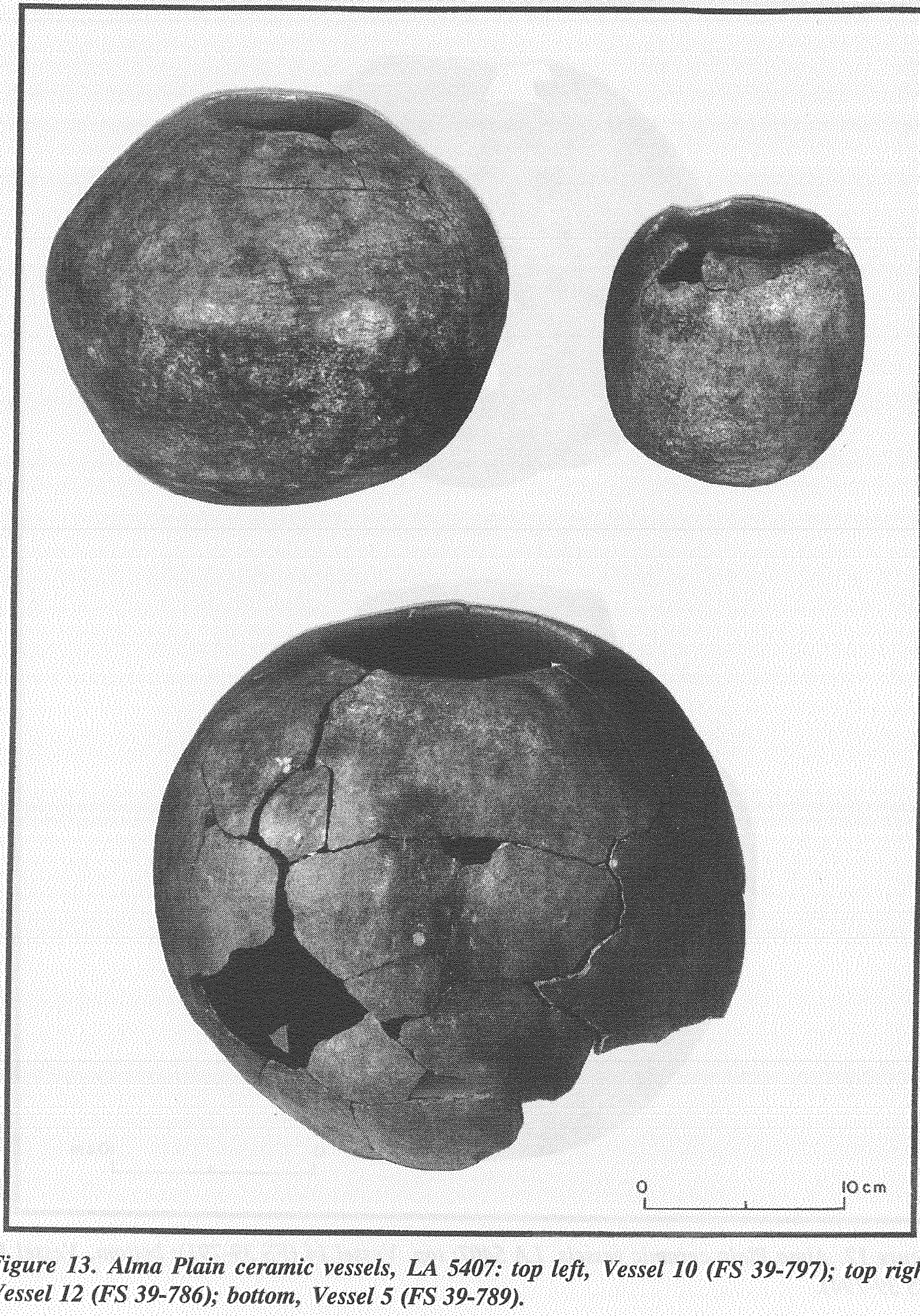

Figure 13. Alma Plain ceramic vessels, LA 5407: top left, Vessel 10 (FS 39-797); top right, Vessel 12 (FS 39-786); bottom, Vessel 5 (FS 39-789).

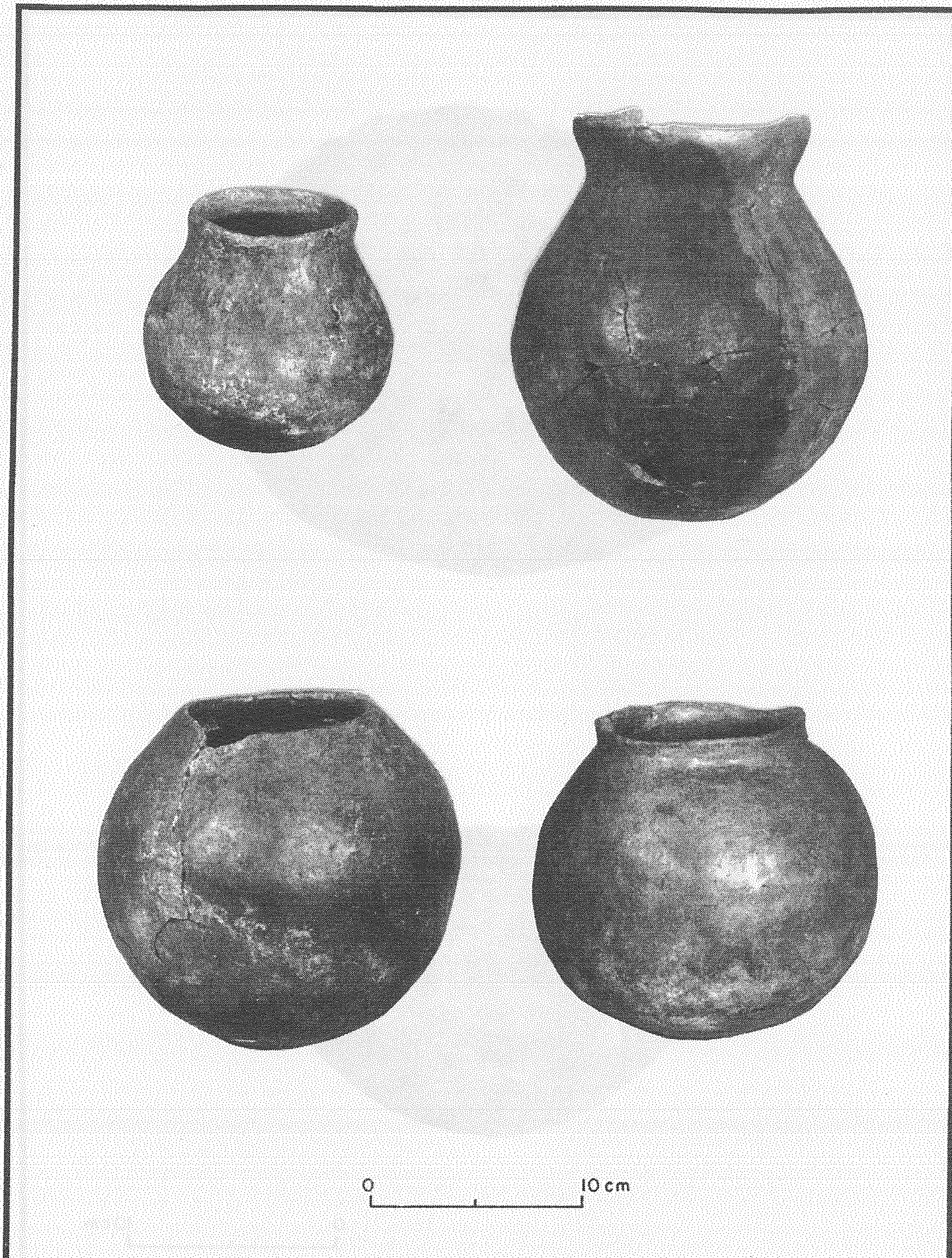

Figure 14. Alma Plain ceramic vessels, LA 5407: top left, Vessel 1 (FS 39-798); top right, Vessel 4 (FS 39-793); bottom left, Vessel 3 (FS 39-792); bottom right, FS 39-20.

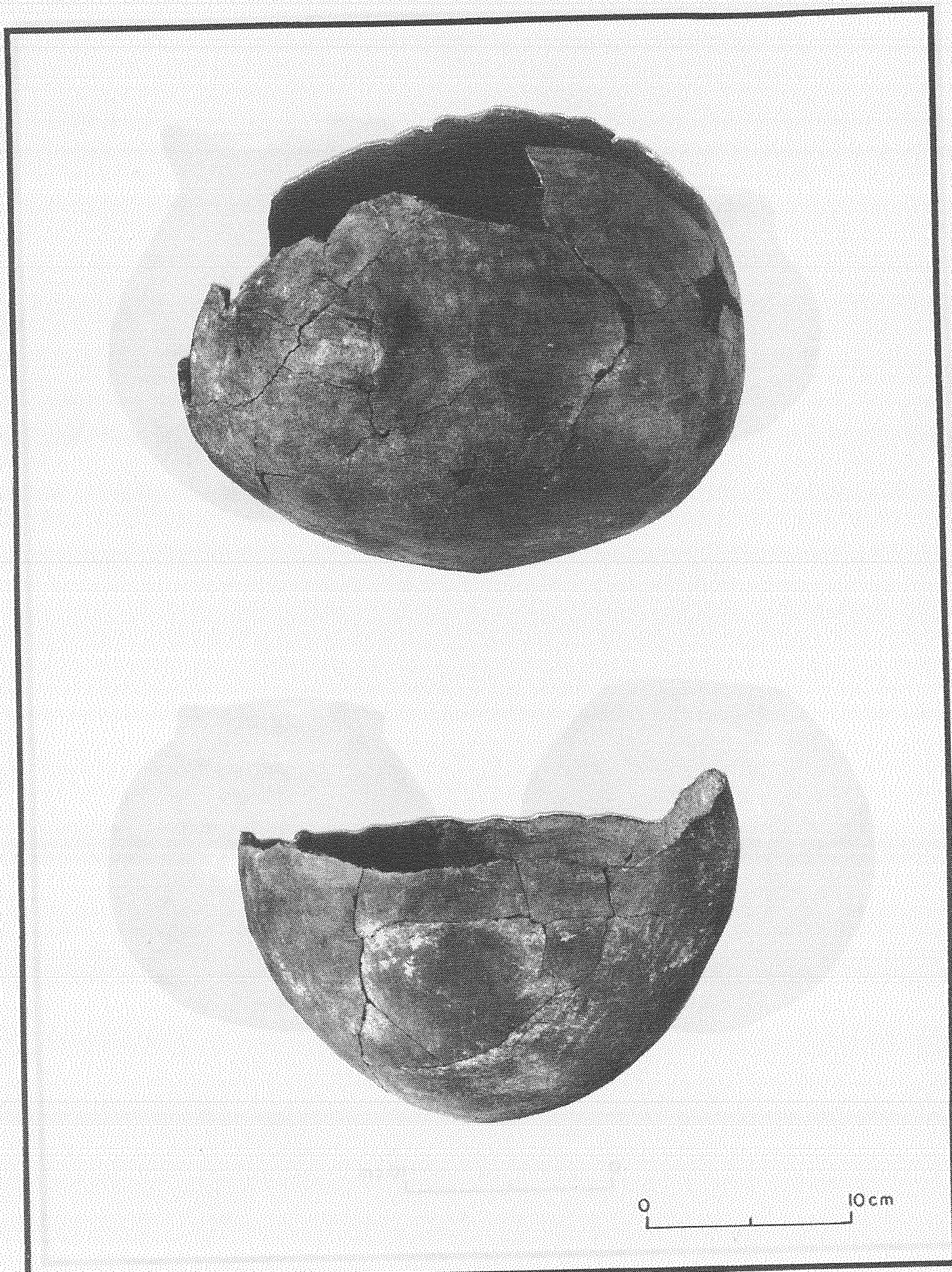

Figure 15. Ceramic vessels, LA 5407: top, Alma Plain, Vessel 8 (FS 39-784); bottom, Mogollon Brown, Vessel 7 (FS 39-795).

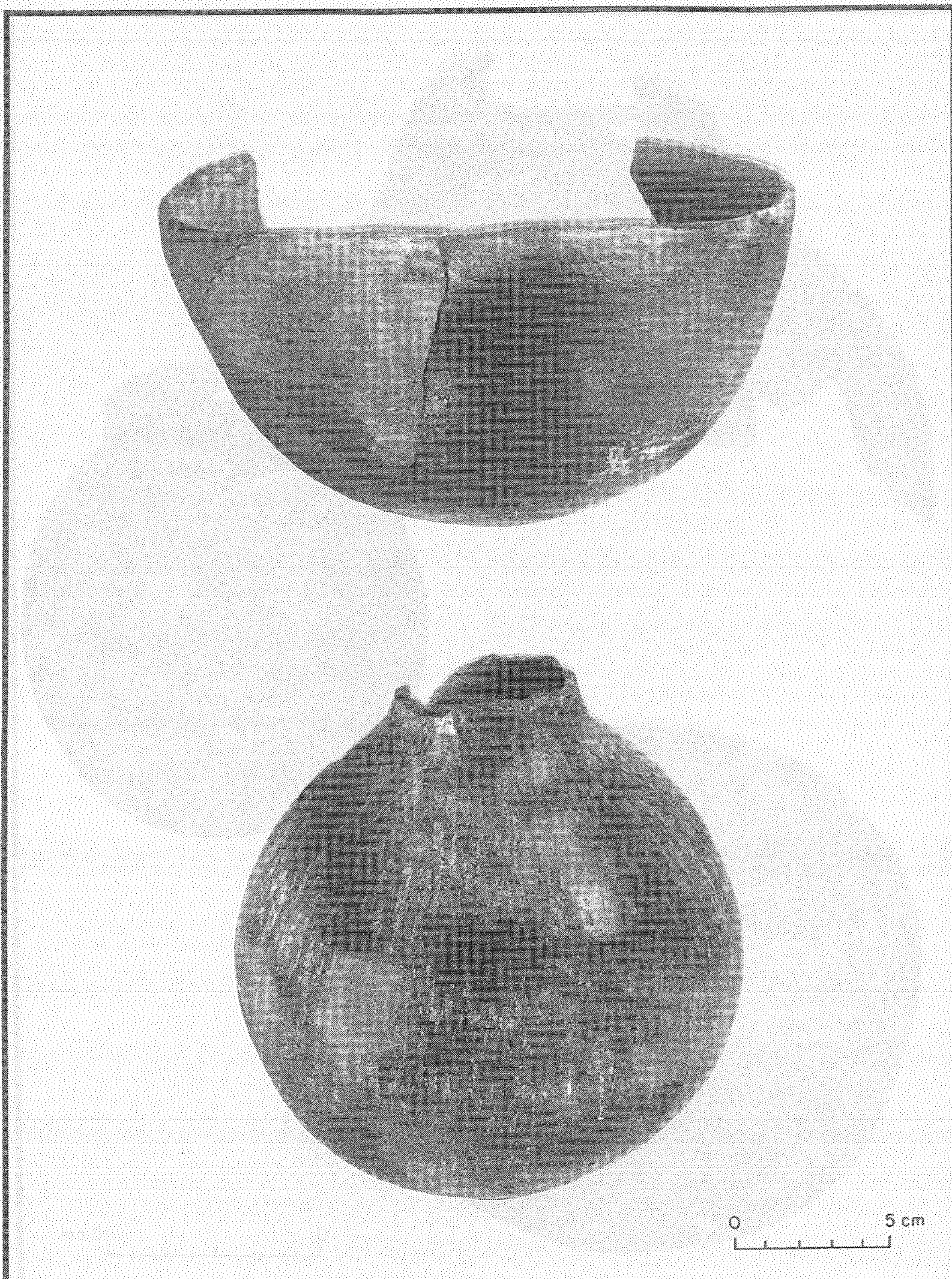

Figure 16. Ceramic vessels, LA 5407: top, Alma Plain, Vessel 11 (FS 39-787); bottom, San Francisco Red, Vessel 2 (FS 39-799).

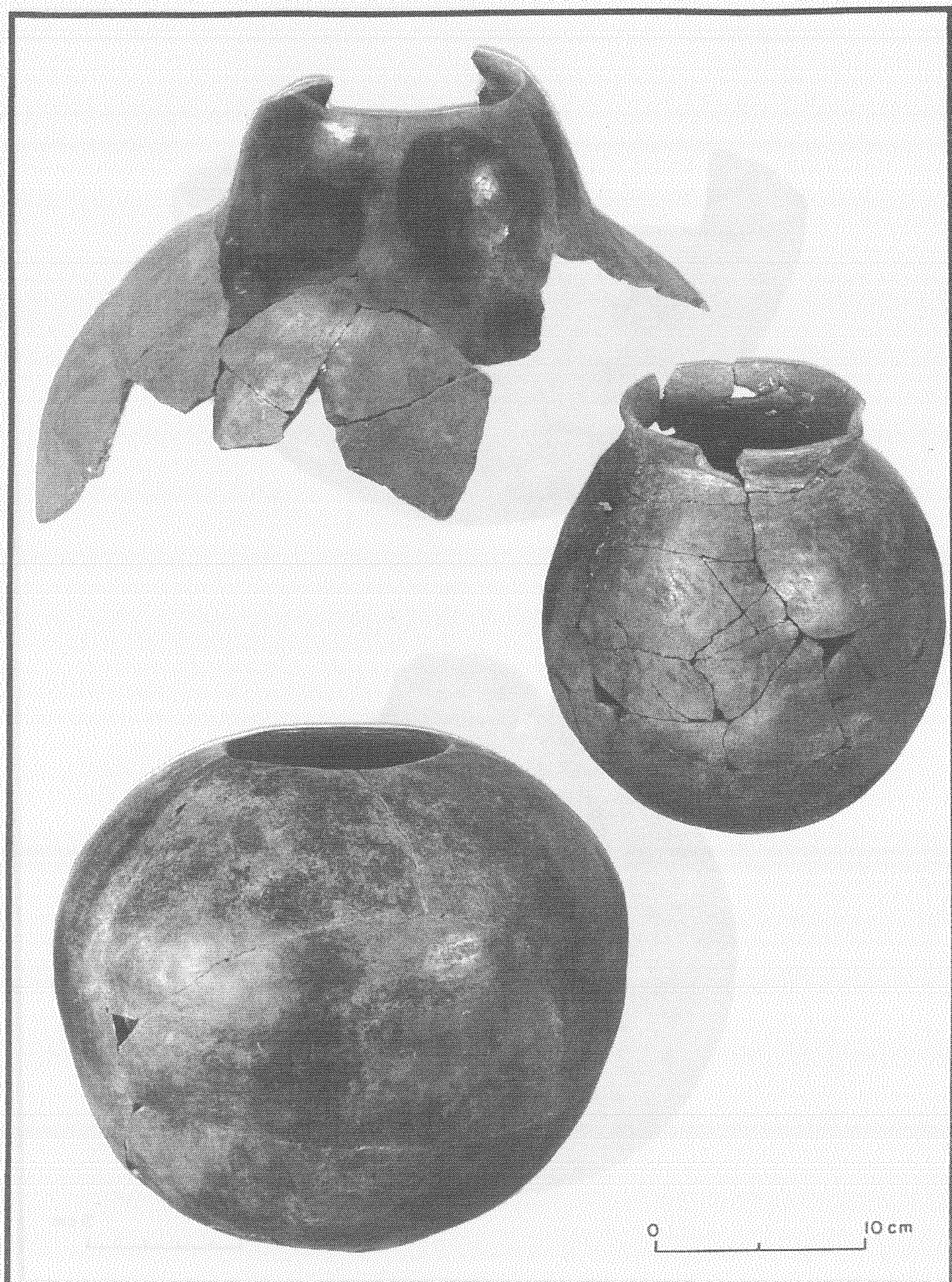

Figure 17. Ceramic vessels, LA 5407: top, San Francisco Red, composite; right, Alma Plain (FS 39-51); bottom, Alma Plain (FS 25-195).

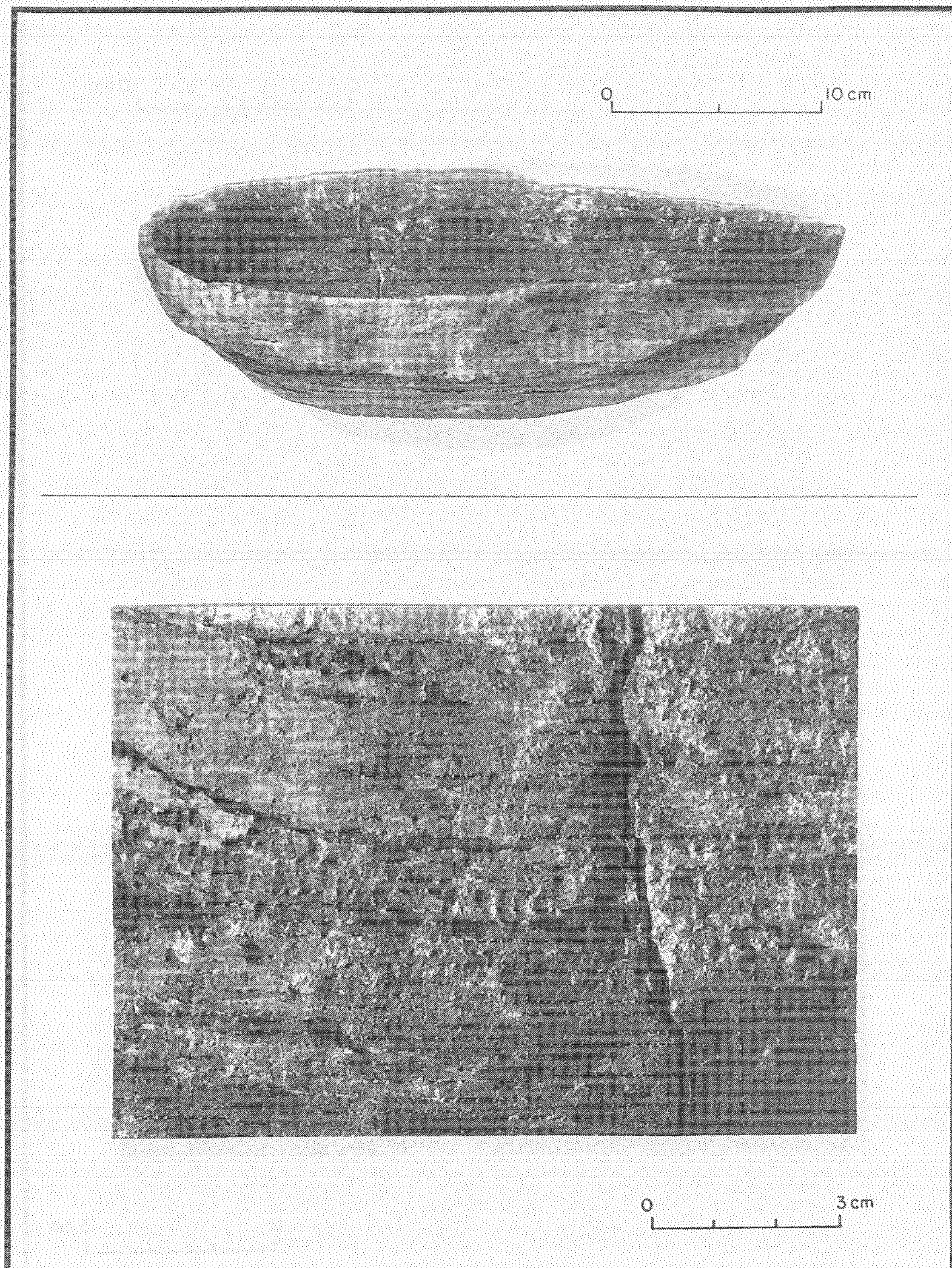

Figure 18. Basket liner and detail, Vessel 6 (FS 39-796), LA 5407.

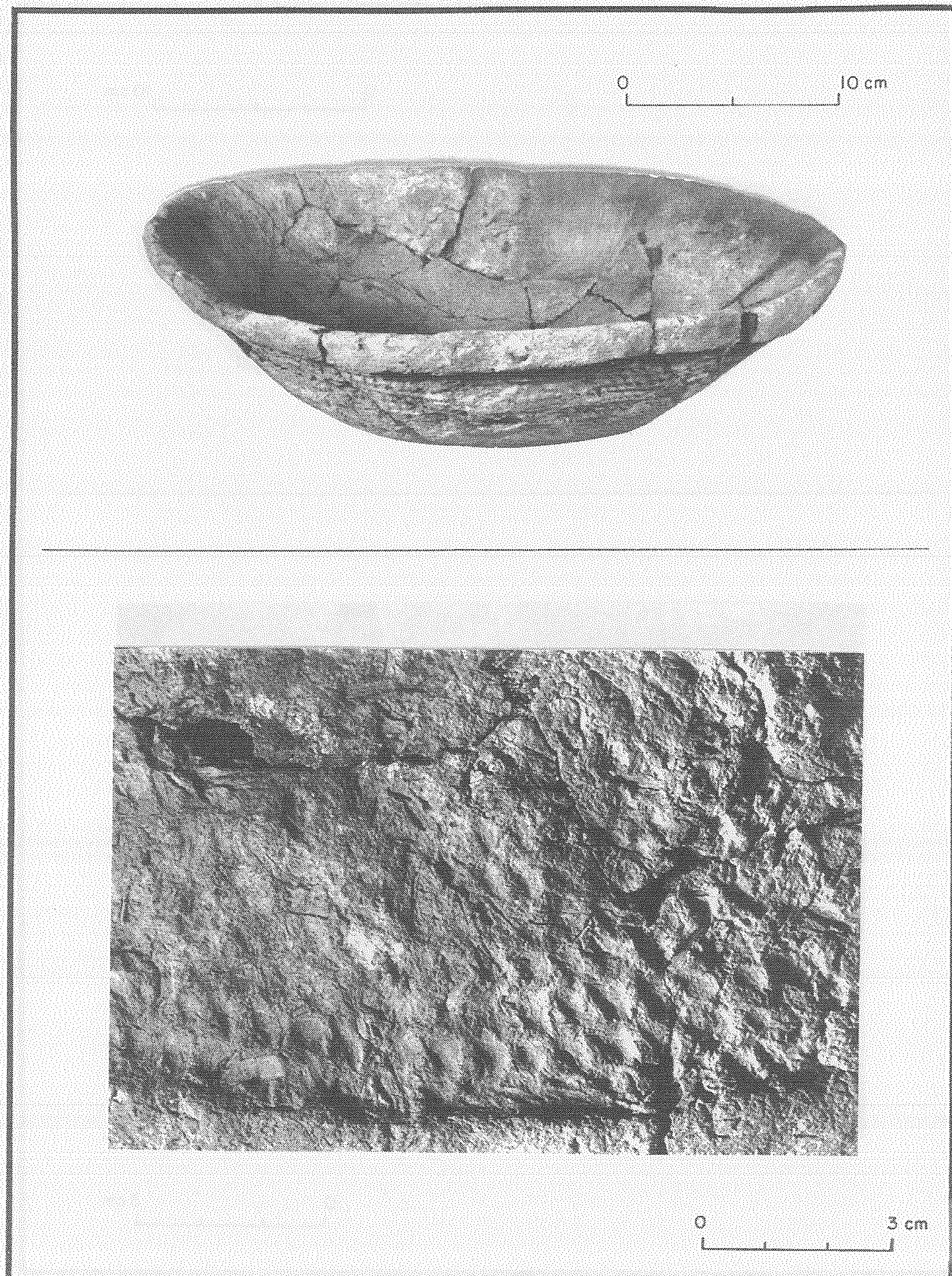

Figure 19. Basket liner and detail, Vessel 9 (FS 39-788), LA 5407.

villages as heavily tempered with angular and rounded material, and Nesbitt (1938:137) describes the temper at Starkweather as angular crushed rock. Temper at Forestdale consisted of some rounded quartz grains with an abundance of soft, white, angular particles (Haury and Sayles 1947:48-52).

Alma Smudged

Twenty-three sherds of Alma Smudged were recovered, all from bowls. These were well polished on the exterior and polished and smudged on the interior surfaces. The polishing does not approach the burnished quality that appears later in the Mogollon.

Mogollon Brown

The Mogollon Brown ware sherds from LA 5407 could possibly be typed as Alma Rough. These are represented in two sherd lots. Most were from a small, open-mouthed, everted-rim jar from the southwest quarter of Feature 39. They conform to the basic type description (Martin 1940:78-80), as do eight sherds also from Feature 39 that fit together to form a small, crude, shallow bowl shaped by pinching (Fig. 15, bottom). The paste and temper are identical to those of the Alma Plain from this site.

San Francisco Red

The San Francisco Red sherds pose a special problem. While most were identifiable as the type described by Haury (1936:28-31), there is an apparent variant at LA 5407. One large vessel was coated on the neck and shoulder portions with a thin, evenly spread red slip, leaving the jar bottom unslipped. Several large sherds also show evidence of being only partially slipped. All surfaces are well polished, with polishing marks frequently apparent and sometimes undulating or bumpy (Figs. 16, bottom; and 17, top). Interiors of jars are scraped but not polished. Fire clouding is common. Paste and temper are identical to that of the Alma Plain at the site. The paste is granular, with abundant temper of heterogeneous, rounded and subrounded sand. Grain size was 0.25 mm or smaller. A few sherds (n=6) had polished and smudged interiors. Bowl and jar forms are almost equally represented.

Basket Liners

Two basket liners were recovered from the floor of the main chamber (Figs. 18 and 19). These were formed by pressing clay into shallow, wide baskets. The clay was brought up over the basket edge and folded over itself to form an irregular collar above the basket rim. Basket impressions show on the rest of the vessel below the collar. The paste is very granular and poorly compacted. Tempering material is coarse vegetal matter, probably juniper bark. Strips and fibers of bark, as well as their impressions, are visible without magnification. Whether a secondary tempering material was used is questionable. Rounded grains and crushed conglomerate particles (subangular) occur but may be natural inclusions in the clay used for the manufacture of these vessels.

Ceramic Distribution

The ceramics from LA 5407 were primarily from the Alma series, mainly Alma Plain (88.5 percent). Alma Smudged (0.6 percent), Mogollon Brown (1.3 percent), and San Francisco Red (9.4 percent) made up much of the rest. Four later wares were recovered, usually from high in the fill.

Tables 8 to 12 give the provenience breakdown and summary of the recovered assemblage.

Differences in the spatial distribution of the wares are minor (Table 12). San Francisco Red is least well represented in the main chamber (7.9 percent) and most common in the antechamber (11.6 percent). Overall, the ratio of jar to bowl forms is fairly consistent in the strip features, Feature 27, and Feature 25 (7.4, 7.7, and 7.0 percent) but less frequent in the main chamber (4.5 percent). The latter may reflect storage in the structure; however, given how the rest of the site was collected, this is far from certain.

Compared with the SU site (Rinaldo 1940:84), LA 5407 differs mainly in the proportion of Mogollon Brown. At SU "unpolished brown" comprised 28.5 percent compared to only 1.3 percent at LA 5407. Alma Plain comprised 52.0 percent and San Francisco Red 19.5 percent of the SU assemblage. Mogollon Brown was not identified at the Williams site. San Francisco Red comprised 13.6 percent of the assemblage from the pithouse portion of the site (Smith 1973:28).

Three Alma Plain and three San Francisco Red sherds were submitted for petrographic analysis, all from the northwest quadrant of the main chamber. One of the San Francisco Red and all the Alma Plain sherds are tempered with augite latite and possibly manufactured in the area. The other two San Francisco Red sherds have sand plus volcanic rock temper consistent with a sample of sand from the site (Garrett, this volume).

Jars are the primary vessel form recovered from LA 5407 (Table 13). A single sherd from a scoop was found in one of the strip features (Table 8). Whole and partial vessels exhibit a variety of shapes and sizes. Table 14 gives the locational, dimensional, and other information of the vessels. Figure 20 shows the shapes and relative sizes.

Whole vessels were primarily from the northern half of the main chamber and almost equally divided between the northeast and the northwest quads. The assemblage of whole vessels represents a rather unique view of a contemporaneous ceramic assemblage.

The three painted sherds were recovered from fill locations and are not associated with the site occupation. No gray utility wares were recorded. Intrusive Anasazi sherds were also found high in the fill of Mogollon sites further south, the Pine Lawn Valley (Martin et. al. 1949:184; Martin and Rinaldo 1950a:370), and the SU site (Johnson 1947:362; Martin and Darrow 1943:236).

Lithic Summary

Lithic artifacts from LA 5407 include 586 flakes, 139 angular debris, 17 cores, 96 tools, and 10 hammerstones. Shatter caused by burning of the structure may have increased the debitage counts and reduced the number of cores and recognizable tools. More obsidian was found than at any other site. However, rhyolite was the preferred material for tools, indicating that plant processing was more common than animal processing in this assemblage (Wening, this volume).

Ground Stone, by Karen Wening

The LA 5407 ground stone assemblage consists of 135 artifacts (Table 15). All ground stone tools were monitored for material type and color, artifact type, artifact condition, shaping methods, degree of heat exposure, and dimensions to the nearest millimeter. Ground surfaces were additionally observed for frequency, transverse and longitudinal contour shape, texture, presence

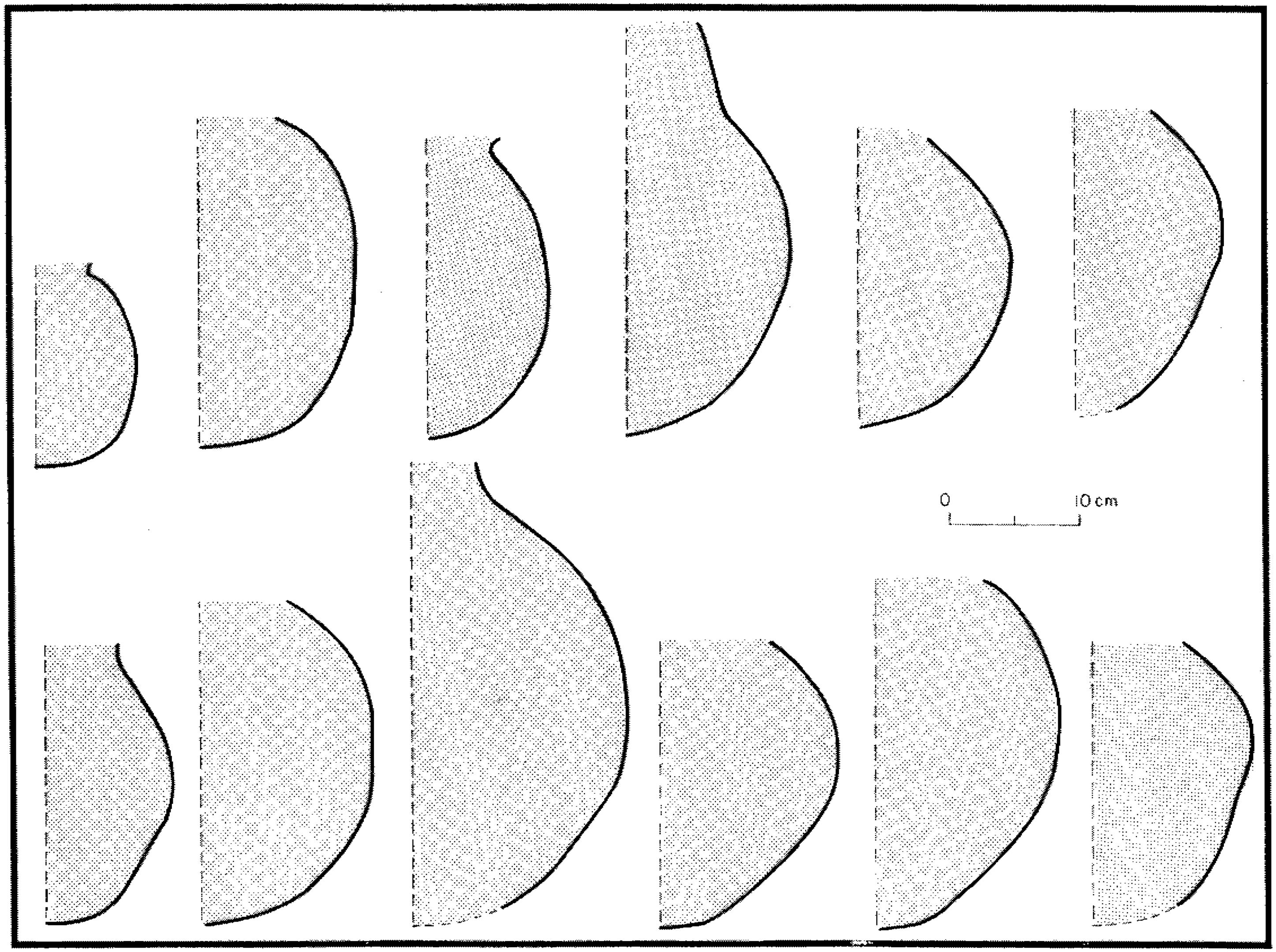

Figure 20. Vessel forms, LA 5407.

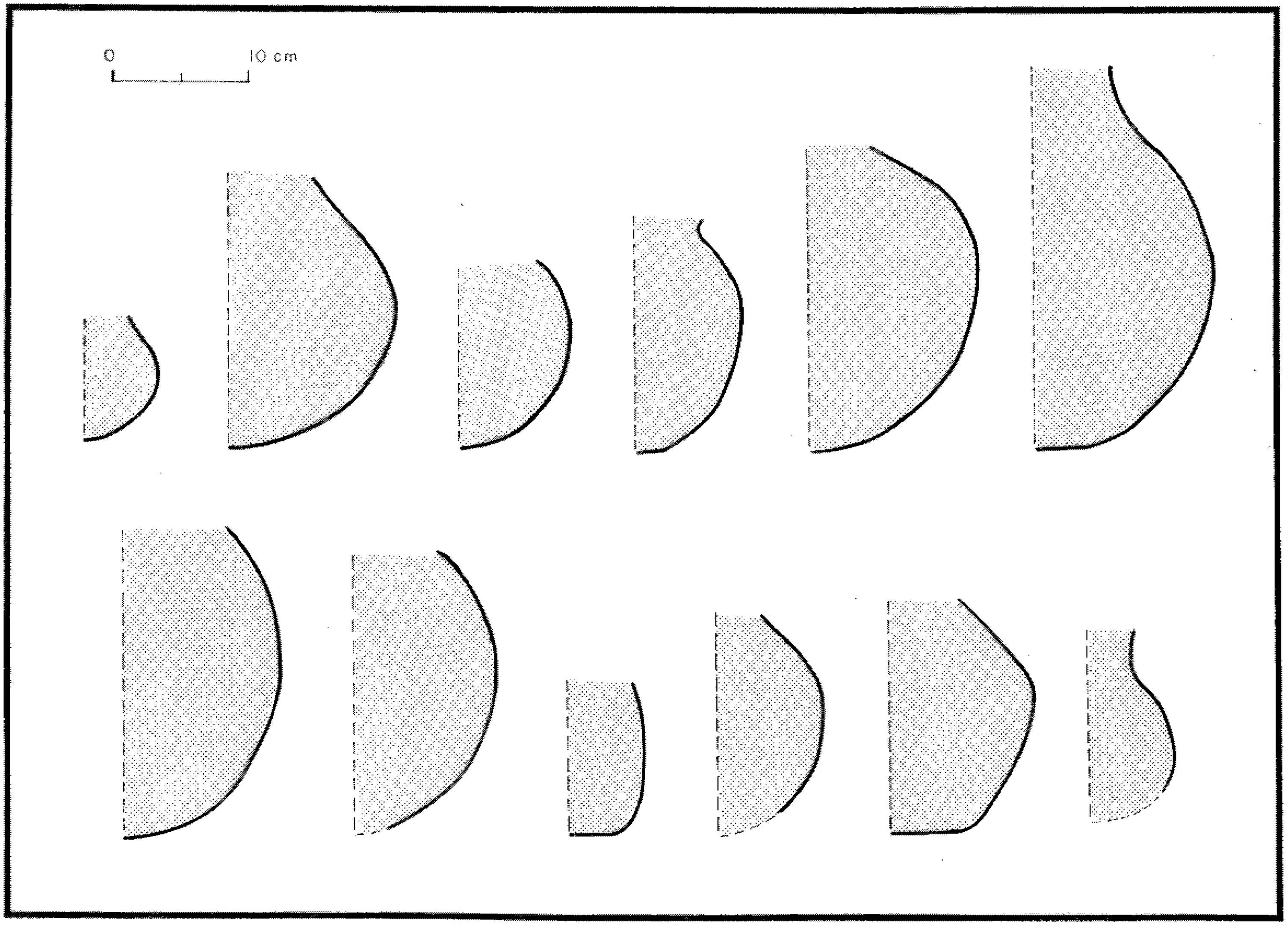

Figure 20 (continued)

and orientation of striations, and presence of pecking to sharpen the surface. Manos were also monitored for transverse cross-sectional shape and number of hands used for manipulation. Metates were additionally monitored for type and depth of use surface.

The *igneous/volcanic* category includes black basalt, gray basalt, and tuff. This category comprises 68 percent (n=92) of all lithic materials used on the site for ground stone. The most abundant (n=79; 58 percent) is a gray to black, fine-grained basalt material containing small, widely spaced vesicles, and occasional large white mineral inclusions. An infrequent variation of this type is a sparsely vesicular, sometimes lighter-colored basalt. Both of these materials are locally available, probably outcropping as andesite and basaltic andesite flows of the Datil Formation, a "cliff-forming flow which caps the highland plateaus" (Warren 1972:22). Tuff, which is represented by three artifacts, may originate either from local Gila Conglomerate or the Datil Formation.

Quartzite is the next most abundant material in the ground stone assemblage (n=21; 15 percent). It is probably locally abundant in nearby Largo Creek or Apache Creek river gravels.

Sandstone, both fine and coarse grained, is formed from eroding volcanic materials that are white to gray, fairly well indurated rocks. Sandstone of this type outcrops both in the Gila Conglomerate and Datil Formation. Datil Formation descriptions are closer in color to the LA 5407 material than those of the Gila Conglomerate (Warren 1972:23).

Siltstone and *rhyolite* comprise the remaining four artifacts (3 percent). These are described in the lithic artifact section.

Manos (n=44). Two-hand manos (n=19) are the most uniform mano group at the site and reflect the importance of corn in the diet. Most are well shaped, rectangular basalt slabs with remarkably consistent lengths and widths. Thickness is the most variable dimension due to its direct relation to degree of use of the mano (Table 16).

Most two-hand manos are ground on two opposing surfaces, though the "top" of the mano is far more lightly ground, probably only to shape and smooth the tool. The "bottom," or primary use-surface, is typically well maintained by pecking, with the remaining high, or unsharpened, areas exhibiting a polished, often striated texture. On other, more uniformly sharpened manos, pecking has completely obliterated the old use-surface.

A variety of transverse cross sections are present on two-hand manos. The most numerous is a truncated triangle shape in which the use surface is opposed by a diagonally oriented surface, creating a greater thickness on the edge nearest the user.

Completely absent in the two-hand mano assemblage are extremes of the above condition, the truncated wedge and wedge shapes of the "mano life cycle" classification commonly used for Puebloan sites. These extreme conditions result in the juncture of two use surfaces and create a thin edge, reducing the east with which it can be handled. The LA 5407 manos were being worn in a different fashion. A single mano at the site exhibits the juncture of two ground surfaces which result in a dome transverse cross-sectional shape. This dome cross section may represent the extreme condition of mano use if the two surfaces are being used equally, which is not the case at this site. One well-defined, heavily used and maintained surface is the norm for two-hand manos here. The top, or opposing, surface often indicated considerable wear, though rarely to the extent that the bottom surface does. In general, the thinner the mano, the more transversely convex the upper surface becomes, and the more pronounced a dome cross-sectional shape becomes.

Other cross-sectional shapes in this mano group include slab (n=6; 31.5 percent), triangular (n=2; 10.5 percent), and one indeterminate (0.5 percent). All manos in this group were used on trough metates (with one end open), by far the predominant metate type at the site. The metates exhibit ground surfaces similar to those of the manos. Heavy use and subsequent sharpening are common, as well as almost exclusive use of the abrasive andesitic basalt. This is not the case with the one-hand mano group.

One-hand manos (n=19; 43 percent) are the least uniform ground stone artifact type in the LA 5407 assemblage and are grouped here based on two common characteristics: the length does not exceed 15 cm, and wear indicates the tools were used with a base stone in a reciprocal motion rather than a multidirectional one, as often occurs on the polishers. Abrasive materials such as basalt and sandstone are commonly used. Though all one-hand manos possess the above two characteristics, five subgroups were formed to better describe the tools.

Subgroup 1 consists of four manos formed from flattened, round to oval basalt cobbles (Fig. 21). All have been shaped by various methods, leaving fairly smooth, rounded edges. Ground surfaces vary in texture from a very coarse, abrasive vesicular basalt to a fine-grained, cortical basalt surface. Ground surface contours vary also, with one markedly convex surface and three flat surfaces. Both unidirectional and bidirectional striations are present on the use surfaces.

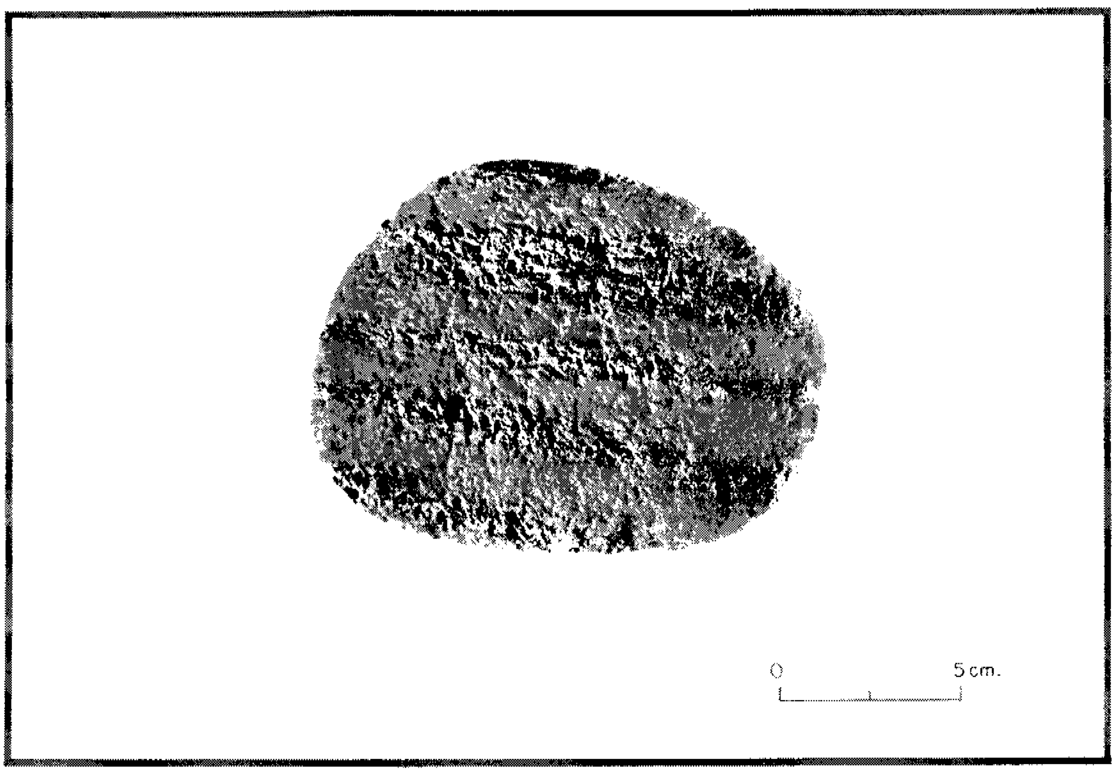

Figure 21. Mano (FS 39-149), LA 5407.

Subgroup 2 is comprised of four quartzite cobbles, two of which have been heavily abraded in a reciprocal motion, and one of which exhibits red pigment stains on two surfaces. The two other quartzite manos are spherical rather than flattened and appear to have been used extensively as hammerstones around the entire perimeter. Although well defined grinding facets are present, battering wear in some areas overlies grinding wear, as well as the reverse, indicating either a multipurpose tool or a combination pounding/grinding type of tool such as a pestle.

Subgroup 3 consists of two large, thick oval basalt cobbles that are unshaped. Both exhibit light grinding over coarse, vesicular surfaces. Subgroup 4 is two small, unshaped pumice cobbles that are lightly ground on one surface. One exhibits heavy red pigment stains.

Subgroup 5 consists of the remaining seven one-hand manos. These are small, unshaped sandstone or igneous cobbles. One igneous cobble in this group bears red pigment stains on a unidirectionally and bidirectionally striated surface.

Indeterminate mano fragments (n=6) are mostly portions of two-hand manos but cannot be confidently assigned to either group. Two are of sandstone, and four are of igneous material.

Polishers (n=14)

Polishers are round or oval cobbles that are unshaped or minimally shaped. Wear occurs on smooth, cortical, convex surfaces, and multidirectional or reciprocal striations are often present (n=12; 86 percent). The smooth, nonabrasive use-surfaces of polishers are the primary criteria used to distinguish them from manos. Although they share typological characteristics with one-hand manos (maximum dimension of 15 cm and use on base stones), the remarkably uniform selection of small cobbles (Table 17) and the consistent presence of polished, striated surfaces indicate tools of specialized function.

Battering around the perimeters of four polishers indicate additional use as hammerstones, and one polisher was bimarginally chipped along one edge and subsequently used as a chopper. Unlike manos, clearly defined grinding facets are absent on polishers and are perhaps indicative of use on unrestricted, more malleable surfaces such as pots, earth floors, or hides. The lack of faceted use surfaces may also point to the manipulation of the tool. For example, a low-pressure, rolling type of motion, required to process certain seed types such as piñon nuts and ricegrass, may have less tendency to produce sharply defined use surfaces.

Polishing Stones (n=16)

Polishing stones are typically small, oval, unshaped cobbles of siltstone, quartzite, or igneous material which exhibit one or two opposing use-surfaces of a polished, often striated texture. They are commonly assumed to have been used for pot polishing, though red pigment stains (n=1) and hammerstone wear (n=2) are present also. The mean dimensions of polishing stones are in Table 18.

One stone only exhibits a well-delineated grinding surface with unidirectional and bidirectional striations. Two anomalous polishing stones are present. One vesicular basalt stone exhibits a single smooth, cortical surface with slight grinding wear, and another siltstone pebble has numerous deep, parallel "incisions" running around the width of the stone. They appear to be natural, having a fossil-like appearance. Wear is present over these natural lines in the form of multidirectional striations over the entire surface.

Metates (n=18)

Metates are almost exclusively of basalt or vesicular basalt (n=16; 89 percent). Two sandstone fragments represent the only other material type.

Trough metates (n=12). Although only four complete metates are present (all of which were reconstructed), most are complete enough to be identified as trough metates (n=12; 67 percent). The four complete specimens are one-end-open trough metates, only one of which has a mano "shelf" at the closed end. It seems likely that the remaining eight trough metates are also "one end closed," typical of Early Pithouse sites in the Gallo project area.

Trough metates are well shaped, rectangular basalt slabs in which the use-surfaces become increasingly concave transversely with depth, not just at the sides but across the entire width. Shallow troughs are nearly flat with slightly concave sides, showing that the marked concavity develops through use, since only deeply worn troughs at the site exhibit this marked curvature from side to side. In other words, the original, flat trough midsection contour is not maintained throughout the life of the metate, but becomes increasingly concave with use. Troughs appear to be manufactured with a flat cross section, which is then altered by applying pressure primarily to the center of the mano rather than the ends. This type of centralized pressure on the mano would be executed with two hands, one laid over the other. It may also be that one-hand manos, as well as two-hand manos, were used in trough metates, a possibility that is discussed further below.

Trough depth ranges from 1.5 to 6.0 cm. The 6.0 cm deep metate is only 4 cm thick at the deepest point. Trough width varies from 21 to 27 cm among those complete enough for measurement (mean width 24 cm, standard deviation 2.2 cm). In some cases the trough occupies considerably less width than that of the metate itself, with the unused width ranging from 5-14 cm. Troughs are occasionally off center within the metate, with the trough set flush with one edge, leaving a wide, unused margin on the other. Perhaps these wider side margins are a variation on the mano shelf, which commonly occurs at the end of the trough.

Since trough width and mano length are obviously related, a preference for a certain size mano is apparent, especially considering the unused width area present on many metates. Stones chosen for trough metates were not exploited to their full width, which may indicate a preference for smaller manos. Mano maneuverability and efficiency were apparently at their best in a particular size range. It is interesting to note that a one-hand mano was found with a trough metate, the most markedly concave trough metate at the site. However, the use-surfaces of the one-hand mano and trough metate do not differ from other trough metates or two-hand manos in the assemblage in that they all appear to be corn-processing tools. It seems possible that mano/metate use combinations were not always static, but may have varied somewhat, with one-hand manos or even polishers serving as hand stones for trough metates. This variable mano/metate use combination was observed at a Basketmaker II pithouse village near Littlewater, where smooth-surfaced, one-hand manos were found to have the most surface contact with slab and trough metates and not with basin metates (Condon in prep.). Smooth-textured manos and/or metates are hypothesized as seed processing tools (Riddell and Prichard 1971:73-74) and ethnographically documented for the Australian Aborigines (Gould et al. 1971:163-164). The smooth-surfaced polishers (possibly used with baskets rather than base stones) and the lapidary stones may have been used for similar, fragile seed hulling at LA 5407.

Basin metate (n=1). The single basalt basin metate is a reshaped, reused portion of a broken metate, presumably a trough, since it is the most numerous type at the site. It is roughly chipped around the entire perimeter into a circular shape (22.5 by 22.0 by 4.8 cm). This metate was reconstructed from four large pieces found in different proveniences within Feature 39. The four metate fragments vary greatly in the degree of exposure to the fire. Some pieces are completely blackened, and others have been unexposed to heat. Lengthwise striations are present inside the basin from previous use as a trough metate or as the smaller, reshaped basin.

Basin Preform (n=1)

A naturally concave basalt rock was chipped into a round shape to form this artifact. No grinding wear is present in the basin (19.5 by 17.5 by 15 cm).

Lapidary Stones (n=13)

Lapidary stones are smooth-surfaced base stones formed from unshaped basalt cobbles (n=2 sandstone specimens, 1 slab and 1 cobble). Ground surfaces are nonabrasive, cortical surfaces with unidirectional and bidirectional or multidirectional striations. Large, flattened cobbles with natural concavities are used, and with the ground surface frequently occupies a small percentage of the cobble face (Table 19).

The two sandstone lapidary stones are admittedly tenuous classifications in this group. One small, fine-grained white sandstone slab is ground on two opposing, concave surfaces that are criss-crossed with a myriad of striations. All but one edge appear to be broken, and none exhibit grinding to shape (9.8 by 7.8 by 1.1 cm). The second sandstone specimen is a small, unshaped cobble with two opposing, naturally concave surfaces (16 by 12 by 5.3 cm).

Slab Covers (n=7)

Slab covers are thin, tabular slabs of basalt (n=5) or sandstone (n=2) that have been chipped into circular (n=1) or subrectangular (n=4) shapes. Two slab covers are too fragmentary to determine the shape. Light grinding, presumably to shape, is occasionally present on the flat surfaces, but never on the edges. Slab cover dimensions vary considerably (Table 20).

The storage pit cover was found in situ over Feature 30 outside Feature 39. All other slab covers (n=6) were found inside the structure and may have served as covers for several of the storage pits, which exhibit diameters of 12, 15, 20, and 28 cm.

Mauls (n=6)

Of the six mauls, four full-grooved, noncobble mauls are nearly identical. They are of basalt (n=2) or vesicular basalt (n=2). Three of these are elongated, blunt-ended forms, and one is oval in plan view (Fig. 22). Pecking and grinding shaping methods are used. Interestingly, damage from wear is completely absent on the bits of three mauls, and the hafting grooves appear rough and newly manufactured. Only one maul has slight, though questionable signs of wear. These four mauls were recovered from Feature 39, two in floor contact and two in the fill.

One cobble maul is completely unmodified except for a pecked groove encircling the width at the midsection. The groove is shallow. Battering wear is present on both cobble ends, though

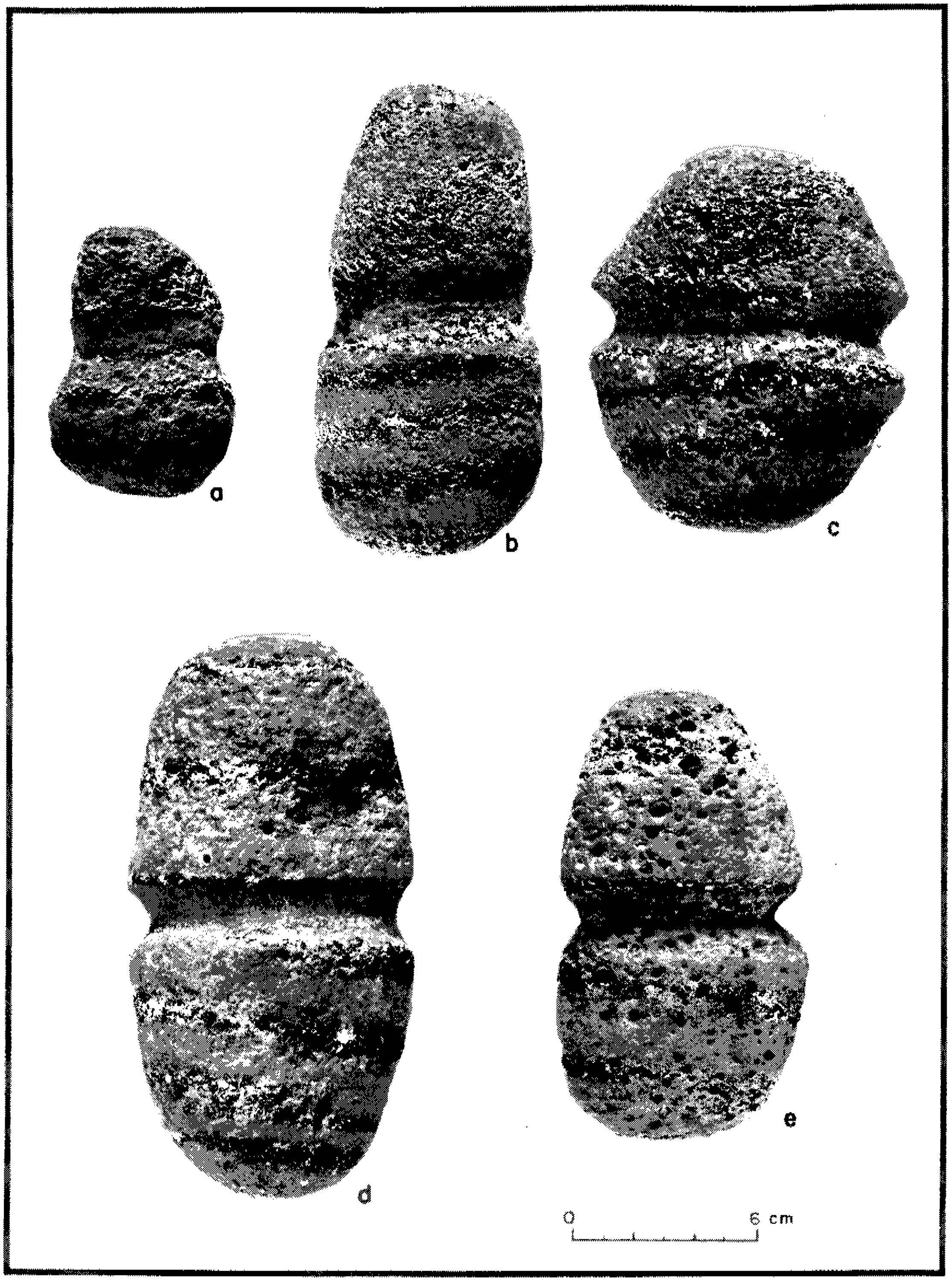

Figure 22. Mauls, LA 5407: (a) FS 39-526; (b) FS 39-27; (c) FS 39-233; (d) FS 39-222; (e) FS 39-719.

heavier wear exists at the larger end of the cobble. It is burned and heat cracked and was found on the floor of Feature 39.

The final maul is formed from a minimally modified, vesicular basalt cobble. Some grinding is present on one flat surface, and a full groove is pecked at the midsection. Wear is present on the larger end only. This small maul originates from the floor fill of Feature 39. Dimensions of complete mauls are provided in Table 21.

Anvil Stone (n=1)

This large quartzite cobble has a 4 cm diameter area of heavy battering on one flat, cortical surface. No other modification is present (14; 3 by 9.9 by 5.7 cm).

Mano/Metate (n=1)

An unshaped basalt cobble is ground on two opposing natural surfaces, one concave and one convex (20.4 by 14.0 by 5.3 cm).

Abrader (?) (n=1)

A small, elongated pumice cobble has a naturally formed hole in one end. Slight grinding wear is present inside this end concavity. The abrasive stone may have been used to round the ends of bone or wood tools. (Outside dimensions 4.5 by 3.8 by 3.1 cm; hole 1.3 by 1.5 cm at opening, narrowing to about 0.8 cm diameter at bottom; hole about 1.0 cm deep.)

Chipped Basalt Implement (n=1)

A thin, tabular basalt rock is bimarginally chipped around the entire perimeter to form a large, side-notched, straight-based projectile point shape (Fig. 23). It was reconstructed from two pieces found in the fill of a storage pit (Feature 36) outside the structure. Slight grinding to shape is present on both flat surfaces as well as inside the notches. Except for the bimarginally chipped edges, the entire surface of the tool is cortical. The distal edges of the blade are lightly abraded, presumably from use rather than shaping.

Chipped Rectangular Fragment (n=1)

This artifact is shaped like the projectile point discussed above, also from a thin, tabular basalt rock. One flat face is ground to a very smooth, glassy shine. The shape of the complete artifact appears to be rectangular, though one broken edge precludes definite shape determination.

Unidentified Ground Stone Fragments (n=9)

Five basalt and four sandstone fragments are ground on flat, convex, or irregular surfaces. Artifacts in this group are too fragmentary for further classification.

Unidentified Chipped Stones (n=3)

One tabular basalt rock is chipped around three edges to form a rectangular shape (26.5 by 22.9 by 6.7 cm). Another basalt rock has several flakes removed along one edge (two adjacent platforms). The rock is roughly triangular in plan shape. The basalt material of which it is made has poor conchoidal fracture unsuitable for use in flintknapping, indicating the rock was probably being shaped to form a tool of a durable nature. The third rock is chipped over its entire surface as if being reduced as a core, yet all edges were heavily ground following this reduction. The poor quality of the material seem to obviate use in chipped stone tool manufacture.

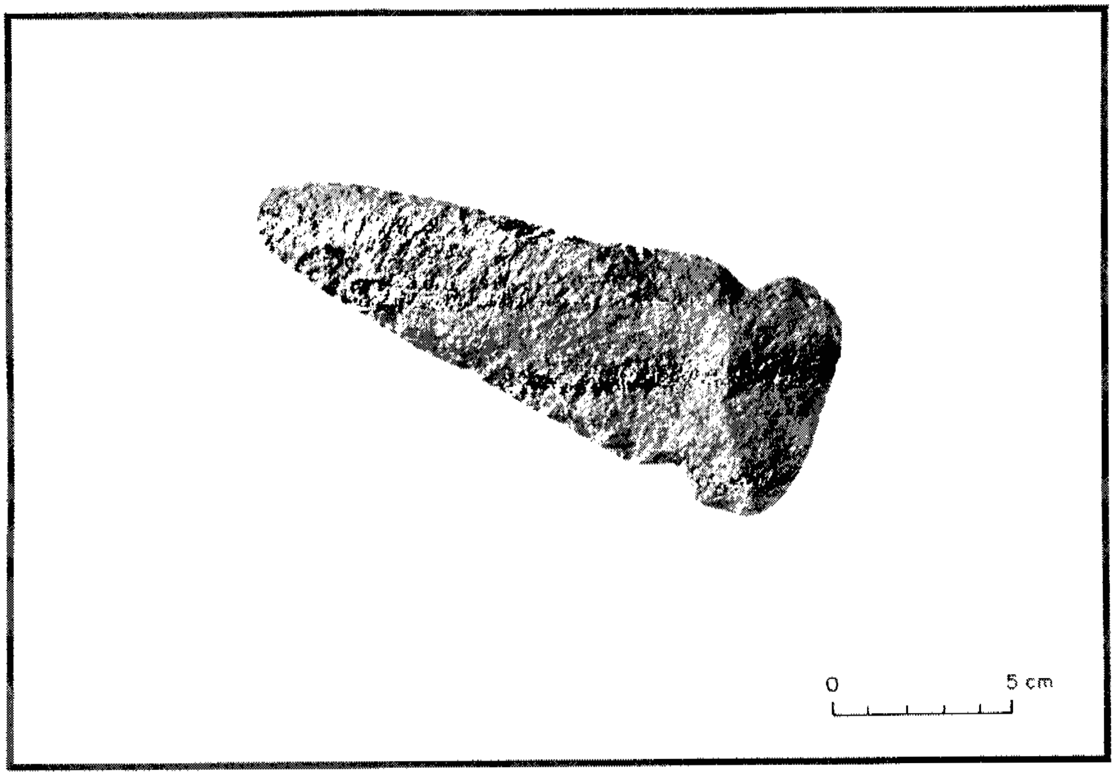

Figure 23. Chipped basalt implement (FS 36-7), LA 5407.

Conclusions

The most characteristic aspect of the LA 5407 ground stone assemblage is the great uniformity displayed by the various specialized tool types. Little variation exists within the trough metate, two-hand mano, polisher, lapidary stone, polishing stone, slab cover, and maul tool groups. The few artifacts that fall outside of the main tool classifications are represented by single artifacts only. The one-hand manos are the only exception to this uniformity, although uniform subgroups are easily discernible.

The few and highly specialized food-processing tools seem to indicate that a small variety of foods was prepared at the site and that dependence on cultivated corn was high. This is particularly evidenced by the high frequency of trough metates and two-hand manos, which together represent 23 percent of the ground stone tool assemblage. Other foods such as pigweed seeds, juniper berries, and piñon nuts may have been processed with the smooth-surfaced manos and small base stones or with baskets. Obviously, the percentage of certain ground stone tools cannot be used as the sole indicator of the importance of corn in the diet since a particular tool type cannot be assumed to have a single, static function. In addition, foods requiring minimal or no processing such as squash and beans would go unrepresented in the ground stone tool assemblage, though their presence in the diet may be an important one. Perhaps the factor most indicative of the importance of corn is the attention paid to the tools assumed to have processed it: the high degree of uniformity and care in manufacture and maintenance of the trough metates and two-hand manos.

Basketry, by Karen Wening

Examples of coiled basketry, cordage, and sandals were recovered from the burned structure. These are described in this section, with a brief discussion of the materials used in construction (Toll and McBride, this volume).

Coiled Basketry (n=19)

Although 19 samples of coiled baskets were analyzed, they are represented by numerous fragments. If several fragments were recovered together, they were analyzed as a single sample if all fragments had the same foundation type and similar coil diameter.

The LA 5407 basket analysis was based on attributes described in *Basketry Technology* (Adavasio 1977). Due to the highly fragmentary and charred condition of the project basket samples, only applicable sections of Adavasio's coiled basketry analysis form were used (Adavasio 1977:54-57). Fragments were analyzed for foundation type, stitch type, and rim.

Of Adavasio's (1977:60-61) 20 foundation types, seven were identified, with one indeterminate type (Table 22). Foundations were additionally monitored for spacing, though all are the close-coiling type (Adavasio 1977:53). In addition, coil diameter (mm) and number of coils per centimeter were recorded. All of these measurements were taken according to illustrated methods (Adavasio 1977:77-79).

The fragmentary nature of many baskets made stitch-type determination tenuous (Fig. 24). Nine specimens appear to have the noninterlocking stitch type, which results in the stitch chains radiating straight out from the center to the basket rim (Adavasio 1977:75). Another nine specimens are too fragmentary for stitch analysis, and one unusual specimen exhibited both noninterlocking split and unsplit stitches. The split-stitch basket is also highly fragmentary (Fig. 24, bottom left), but one well-preserved fragment shows inconsistently split stitches. Two coils show five split stitches side by side, while other coils show three and four split stitches in a row. All other stitches in this basket appear to be noninterlocking, simple stitches. However, one side of some split stitches appears to have been burned away, particularly where the stitch was split into two uneven halves, in which case a small stub of the thinner half is remaining. Additional stitch attributes include stitch engagement of the coil (encircling or piercing); stitch width and stitch gap, if any (mm); and number of stitches per centimeter.

Finally, all fragments were examined for remnants of the rim. None were found.

According to Adavasio's (1977:2) definition of type, each foundation and stitch type constitute a separate basket type. Nine types thus identifiable in the LA 5407 assemblage are listed in Table 22. On gross macroscopic observation, two basic types are discernible. These two types are divided by appearance only, and though they exhibit nearly identical coil and stitch measurements, foundation elements differ. The first type is a tightly stitched basket with narrow, closely woven coils (3-4 coils per cm). Stitches also are thin (about 1 mm), with absent or minimal stitch gaps

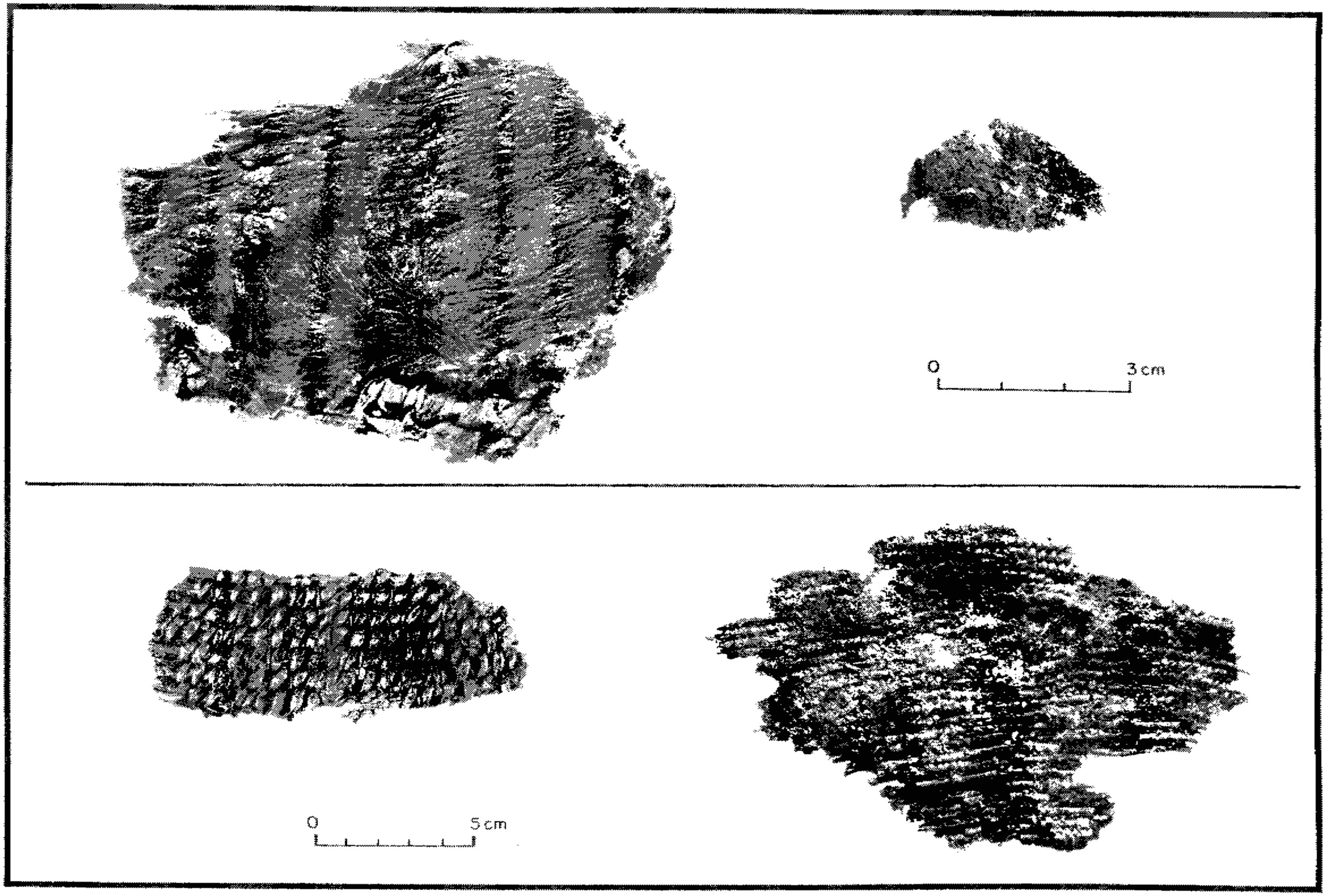

Figure 24. Basket fragments, LA 5407: top left, basket fragment with adhering matting (FS 39-575); top right, twinned matting (FS 39-445); bottom left, split-stitch basket fragment (FS 39-175); bottom right, basket fragment (FS 39-579).

(0- 0.5 mm). This tightly woven type is the most numerous and best preserved at the site (n=13). Foundations of these baskets are almost exclusively bunched (n=8), with two-rod-and-welt types dominating. Other foundation types of the tightly woven baskets include one single-element foundation and two stacked foundations. Coil diameters range from 4 to 6 mm. Two of these baskets were found with thick rod fragments (1-2 cm diameter), which may have served as rim foundations. One of these large-diameter fragments adhered to a coiled basket fragment, though no stitches encircle the rod itself. All other possible rim rods, while found in association with coiled basket fragments, were not encircled with stitches. The tightly woven baskets are rigid and thin-walled, suggesting bowl forms. Patterns were not discernible due to the burned condition of the baskets.

The second major type is a loosely stitched, close-coiled basket (n=6). Foundations are stacked (half rod and bundle, rod and bundle), single-element (bundle with rod core, bundle), or bunched (two rod and welt). Although single-element and bunched foundations are present on both basket types, single-element foundations are more common on the loose-weave type, and bunched foundations are more common on the tight-weave type. Coil diameters are large (7-8 mm), as are stitch widths (2-4 mm). Stitch gaps are quite variable (1-3 mm) and are not uniform within any one fragment or coil. Burning may have affected stitch spacing, however, creating this disconformity.

One curved fragment of this type retains a thick layer of burned corn adhering to the basket interior (Fig. 24, bottom right). A spiral center fragment is also present from a separate specimen, along with an unusual basket fragment with unpatterned, matted fibers adhering to what appears to be the basket interior (Fig. 24, top left). Bowl forms are indicated by the curved wall fragment and the spiral center. This loose-weave type exhibits the only split-stitched basket at the site.

All 19 coiled basket fragments originate in Feature 39. Level distribution is shown in Table 23. Floor contact baskets are from the southwest quad (n=3), southeast quad (n=2), and northwest quad (n=1).

The distribution of LA 5407 coiled-basket foundation types is fairly characteristic of the Mogollon area. According to Scholtz (1975:42), Mogollon sites typically yield two-rod-and-bundle bunched foundations with noninterlocking and occasionally split stitches (300 B.C. ± 200 through A.D. 1100), bundle-with-core foundations and the same stitch type as above (300 B.C. ± 200 through A.D. 1100), bundle foundations and noninterlocking stitches (A.D. 500 through 1100), and half-rod-and-bundle foundations with noninterlocking stitches (B.C. 300 ± 200 through A.D. 1100). Adavasio (1971:104) cites the two rod and bundle bunched with noninterlocking or split stitches as a typical southwestern type. This particular type has no early occurrence north of the Colorado River and "appears to be a local and early elaboration on the basic one rod foundation" of the Utah Desha Complex (5000-6000 B.C.), from which Adavasio (1971:103-104) sees the southwestern basket tradition emerging. Once this two-rod-and-bundle bunched foundation arose, "it became the standard coiling technique for much of the southwest" (Adavasio 1971:104). Local variations of this type ensued, although they are found in far fewer numbers. Adavasio summarizes the development: "Taken as a unit, southwestern textiles apparently represent basically local developments stimulated very early by diffusion from the eastern Great Basin and perhaps affected later by developments Mexico; particularly the appearance of bundle foundation and coiling and twilling may be due to Mexican inspiration" (Adavasio 1971:106).

Cordage (n=48)

Of the 48 pieces of cordage found at LA 5407, 28 are cord fragments, 9 are knotted cords, 9 are folded, side-by-side cords, 1 is braided, and 1 is a cord fragment with cross fibers attached. A variety of cord and ply twist combinations were observed (Table 24). The large number of untwisted plies appears to be caused at least in part by the fire in Feature 39, from which all cordage originates. Heat exposure has blackened literally every piece of cord and seems to have contributed to the unraveling of both cord and plies.

Cord diameter was also affected, with a wide range represented (0.2-1.0 cm). The vast majority of cord fragments fall in the middle of this range, however (0.5-0.6 cm). Cord lengths vary from 1.5 to 10.0 cm.

Of the nine knotted cords, four are single-cord overhand knots, one is a double-cord overhand knot, one is a "sheet bend on a bight" (Graumon 1945:20, Fig. 5), and two are too fragmentary for knot type identification.

Two unusual groups of cords, consisting of three and six cords each, are folded and laid side by side (adhering together). These folded cords appear to be the warp fragments of a twined mat or bag, but without weft material, this identification is tentative.

One cord fragment exhibits very thin strands of weft material adhering in right angles to the cord length (5.5 cm long). And finally, a short braid fragment consists of 3-2 ply, Z-twist cords (5.5 cm long, 0.8 cm diameter).

A large percentage of the cord from the site probably consists of sandal ties, because short cord fragments are found with numerous sandal specimens. Cordage also served as warp material for sandals. Cord may also have served as warp material for twined mats or bags, but since only one twined specimen was identified at the site, this is a tentative conclusion.

Cordage was found in both the main chamber (n=46) and antechamber (n=2). Fill and floor-fill levels contained most cord fragments (n=29 and n=10, respectively) with nine cords found on the floor. The floor-contact cords include the previously described knot of two cords and the cord fragment with adhered cross fibers.

Twining (n=1)

A single sample of twining was found at the site (Fig. 24, top right). It appears to be from a mat or bag (3.2 by 1.8 by 0.2 cm). The twining is of the simple, close-twining method, using very thin (1 mm diameter), single-ply, Z-twist cord. There are approximately four warps and seven wefts per centimeter. The specimen was recovered from near the floor in the southwest quadrant of Feature 39.

Sandals (n=61)

Only one complete specimen was found in this large sandal assemblage (Fig. 25). Many sandals are highly fragmented. The most common identifiable sandal-construction method consists of a continuous outer warp of an S-twisted, 2 ply cord thicker than the inner warps (11 sandals). The inner warps are thinner, single-strand cords looped over the outer warp at the toe and then

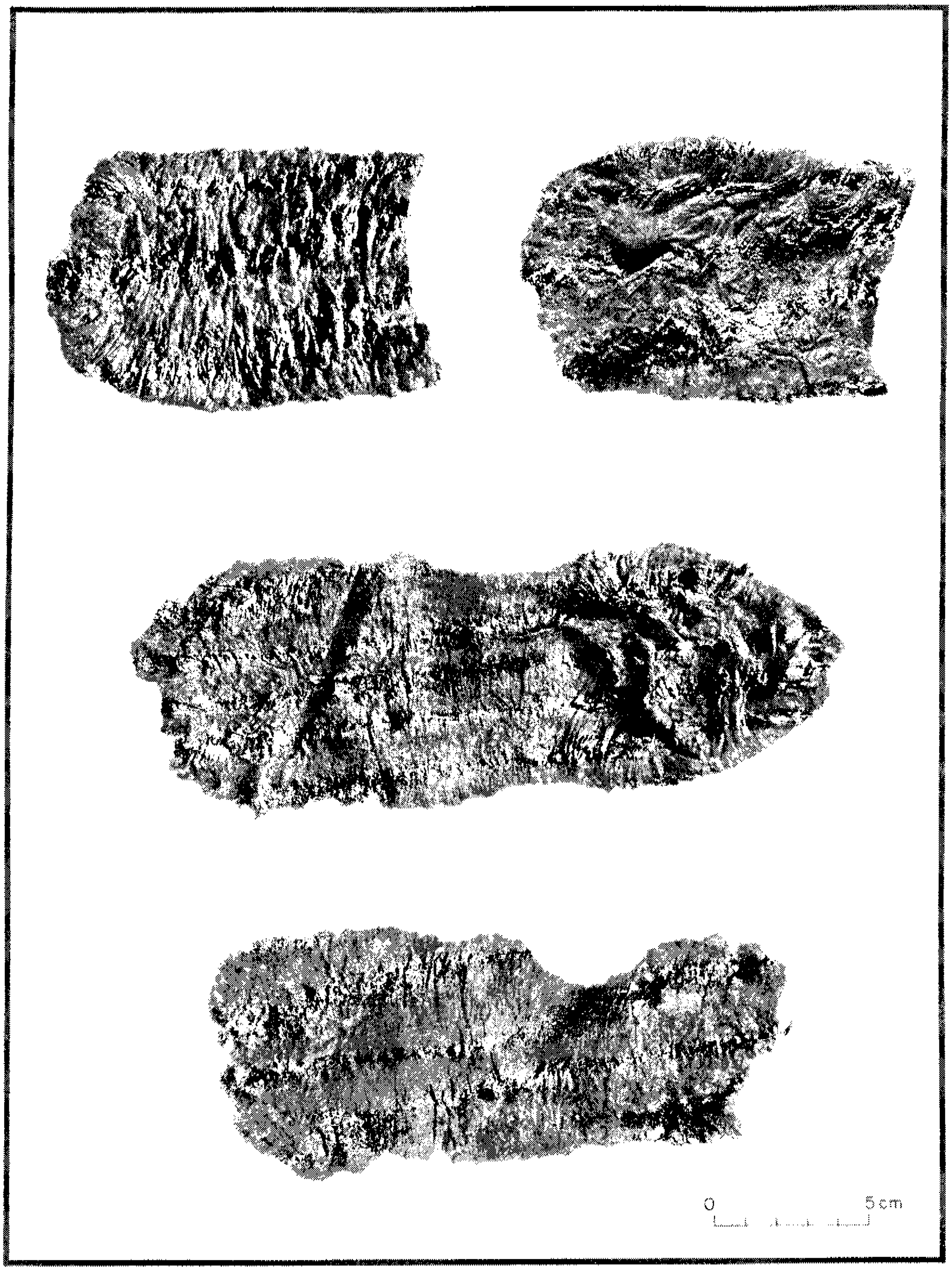

Figure 25. Sandals, LA 5407: top left and right, FS 39-498; middle, FS 39-781; bottom, FS 39-577.

twisted around themselves to form 2 ply, S-twist warps down to the heel. The inner warps appear to be tied together at the heel. Wefts are loosely twisted single strands woven under-one-over-one across the warps. Wefts are looped over the outer edges and woven back through to secure loose ends.

Six warps are by far the most common number, though 8 and 10 warps were also identified (Table 25). One sandal with 8 warps and both 10 warp sandals are very tightly woven and well made, with thinner weft cords than sandals with fewer warps. One 10 warp sandal exhibits approximately 14 wefts per centimeter and is quite thin (3-4 mm). Although the number of wefts per centimeter cannot be determined for most sandals, six or seven wefts appears most common for sandals with five to eight warps. Toe ties, seldom present, consist of at least two cords secured around the outer warp either at the center or slightly off center at the toe. Cord fragments are frequently associated with sandals and may be toe and/or heel tie remains.

Concentric construction is a second, less common method. It consists of three concentrically arranged cords tied together by a separate cord at the toe and heel (Martin et al. 1952:291, Fig. 106, left drawing). One cord forms a continuous outer warp, and two cords form the inner warps. Though only four sandals could be definitely analyzed as concentric, three additional sandals are listed as possibly concentric. Though the concentric method may be the least preferred, the large number of unidentified construction methods makes this conclusion tentative.

Three children's sandals could be positively identified (Table 26), and one complete and one nearly complete adult sandal were recovered. One wickerwork sandal exhibits a continuous outer warp, with interior warps folded over the outer warp at the toe. Eight warps are present. The heel and toe ties appear similar to a "typical" type in the Mogollon (Martin et al. 1952:281, Fig. 100). Weft weave is tight (length, 24.5 cm; maximum width, 9.2 cm; toe width, 8.2 cm; heel width, 7.0 cm; instep width, 7.5 cm). The second, nearly complete adult sandal is also wickerwork. The outer warp is continuous, with three inner warps folded over in the same manner as the sandal discussed above. Whole yucca leaves appear to have been used for warp material rather than the cord typical of the site (length, 24.0 cm; maximum width, 9.3 cm; toe width, 8.0 cm; instep width, 8.2 cm). Of the remaining fragmentary sandals, 22 exhibit complete heel, toe, or midsection widths (Table 27).

All sandals came from Feature 39. An impressive 49 percent were from floor-contact proveniences (Table 28). Sandals were found primarily in the inner zone of the northeast quad (n=20), with fewer numbers in the southeast quad (n=10), northwest quad (n=6), and southwest quad (n=5). The paucity of sandals in the floor-fill level is probably primarily related to the shallow depth of the level (0-5 or 0-10 cm above the floor).

Miscellaneous Artifacts

Wooden Tools

Eleven field specimen (FS) numbers were assigned to objects collected as wooden tools (Table 29). These pieces of burned wood were not obvious examples of tools. The most promising specimen (FS 39-203) was a small branch (9.2 cm long by 0.85 to 1.6 cm in diameter) with a slight bevel over a third of the shaft. Three small pieces (FS 39-292) measuring 1.2 to 2.4 cm long resemble the rounded ends of burned twigs. Two of these are half-circle in profile, which may indicate modification. The remaining examples are even less suggestive. Burning has obscured any evidence of modification--at least under low-power microscopic examination. It is possible that the contexts in which these were found suggested they were tools; however, no such information was recorded.

Ornaments

Only four of the seven pieces of shell listed in the field specimen sheets could be located. All four pieces were fragments of *Glycymeris* bracelets, one of which was modified into a pendant (Fig. 26). Two of the bracelet fragments had decorative notches. Shell bracelets were found at the SU site with burials (Rinaldo 1940:68).

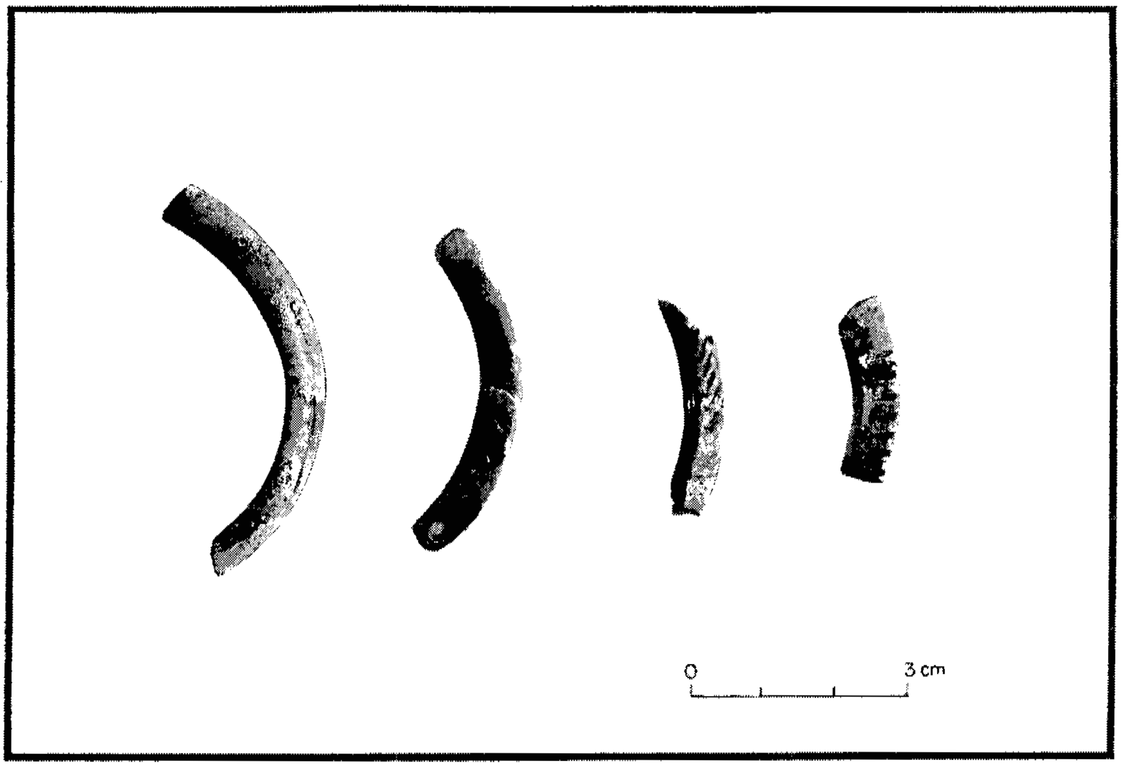

Figure 26. Shell ornaments, LA 5407: left to right, FS 36-5, FS 39-55, FS 39-296, FS 39-622.

Two pieces of bone appear to be parts of ornaments, possibly copies or imitations of shell bracelets. These are described in the bone-tool section.

Pipes

Two small pieces of objects look like fragments of pipes. The first (FS 39-26) was mixed in with the bone from the floor fill of the main chamber. It was made of a black rock, possibly basalt, and is a piece of the mouth end. The surface has small striations and is highly polished. The fragment represents less than one-quarter of the diameter and measures 2.27 by 0.99 cm. The lip edge is rounded, and the wall thickness is 0.34 cm.

The second piece (FS 39-200) was also from the floor fill. It is a highly polished pink and green stone, possibly quartzite. The fragment is from the midsection and represents about one-third of the diameter. It measures 2.1 cm, with a wall thickness of 1.2 cm.

Rinaldo described several pipes from the SU site. Three were ceramic, and four were of scoria and rhyolite. Those made of stone were cylindrical or tubular, with diameters between 2.3 and 5.4 cm. Lengths ranged from 3.0 to 7.7 cm (Rinaldo 1940:74).

Other

A quartz crystal (FS 39-431) from the floor in the southeast quad of the main chamber measures 2.4 by 1.05 by 1.15 cm. A small piece of reddish sandstone-like material from the western fill of Feature 39 was called a gaming piece by the excavators. It is a rounded square shape with a triangular cross section and measures 1.45 by 1.3 by 0.3 cm.

A dark brown formed piece of clay (2.9 by 1.8 by 1.0 cm) was recovered from the floor fill of the northwest quad of the antechamber. It is roughly oval and possibly contains tempering material. It does not appear to have been deliberately fired.

Pieces of "puffed" or melted obsidian and a black-slag material were found throughout the structure from at least 1.35 m below the surface down to floor contact. The slag was shiny, bubbly black, and lightweight. A single piece was found in Feature 40, the refuse just east of the structure, and three pieces around Feature 26.

The azurite and malachite from the site are very small, unmodified pieces. The azurite measures 0.87 by 0.46 cm, and the malachite is 0.23 cm in diameter. Other minerals recovered include calcite, hematite, selenite, and limonite (Wening, this volume).

Discussion

With the exception of the *Glycymeris*, the minerals and other materials originate in the north, in the Zuni Mountain area, or in the south, near Mogollon or Wilcox. Northrop (1959:130-131, 155, 162) lists the following areas of occurrence: azurite in the Mogollon area of Catron County and Zuni Mountain area of Valencia County; calcite in the Mogollon and Taylor Creek areas of Catron County and the Zuni Mountain and Grants areas of Valencia County; selenite in the Zuni Mountain area (Northrop 1959:274); hematite in the Mogollon, Taylor Creek, and Zuni Mountain areas (Northrop 1959:283, 285); limonite (yellow ocher) in the Mogollon and Wilcox areas of Catron County and the Zuni Mountain area (Northrop 1959:330, 332); malachite in the Mogollon, Wilcox, and Zuni Mountain areas (Northrop 1959:340, 342); and quartz crystals in the Mogollon, Taylor Creek, Wilcox, Grants, and Zuni Mountain areas (Northrop 1959:423, 428).

Bone

General methods and a discussion of the species recovered during the Gallo project can be found in a later section of this report. A total of 1,013 bones were recovered from LA 5407 (Table 30). Nearly 23 percent are from rodents and represent postoccupational intrusives or are from dog scats. Few of the rodent bones were burned, suggesting these are nondietary items. In contrast, the percent of burned bone is high for taxa that are the most likely to have been eaten by humans, rabbits and artiodactyls (Table 30).

A minimum of 46 individual animals are represented. Rodents comprise a large portion (50 percent) of the minimum number of individuals (MNI), deceasing to 29 percent of the maximum MNI. This difference indicates that larger portions of rodents were recovered within a provenience, while the economic species were less well represented within a provenience but occurred in more proveniences, another indication that the rodents are intrusive.

Burning

Of the total assemblage, 17.4 percent are burned. The structure has more burned bone than the Feature 27 area. Within the antechamber, the fill has more burned bone than the floor associations, while in the main chamber, the larger percent of burned bone is from the floor and floor fill. The greater amount of burning in the main chamber could indicate more complete burning of this portion of the structure or that much of the antechamber bone was on the roof.

Weathering

Checked or etched bone was relatively rare (7.6 percent). As expected, more of the bone recovered from test trenches and the fill of structures was checked than from deeper fill or floors. More weathering would have been found if the sheet trash had been systematically collected.

Rounding and Carnivore Gnawing

The rounded bone from LA 5407 is consistent with bone that has passed through the digestive tract of a carnivore. These bones range from small to relatively large fragments or even whole bones. Edges are rounded, and pieces may be partially dissolved. While rounded bone was found throughout the site, the Feature 27 area had 85.4 percent of the rounded bone. In particular, the fill of Features 30 and 32 contributed 70.3 percent of all the rounded bone.

Rounding does not correlate with incidences of carnivore gnawing. The numbers of rounded and gnawed bones from the tables result in a correlation coefficient of 7.28110E-03. Feature 36 has the most gnawing, and over half the bone from that feature is rounded.

Age Distribution

Table 31 gives the percent of specimens from each taxa representing individuals that are less than full grown. Immatures (less than one-third adult size) are rare but represent nine taxa. The distribution for young adults (one-third to adult size with unfused epiphyses) is similar, again representing nine taxa. None of the larger animals were immature. However, given the fragmentation of the larger elements and the few long bone ends that were recovered, this is not unexpected.

Provenience Distribution

Miscellaneous. Since the test trenches and stripping were not screened, it is not surprising that few bones were recovered (Table 32). As expected in casual collection, the bone recovered was often from the larger taxa, such as artiodactyls and large mammals. This may also account for the relatively large amount of burned bone and weathering. Larger body sizes tend to be burned fairly often and are weathered because they take longer to be buried.

Features 41 and 42 are the dog burial. Table 33 gives the basic measurements (after Haag 1948). The dog was relatively complete, missing both humeri, some of the foot bones, the scapulae, and the left ulna, radius, and fibula. The skull was broken, precluding most measurements. By Colton's (1970) criteria, the dog was a small variety. The femur measures less than 160 mm.

Feature 27 Area. Over half the site assemblage was recovered from this use area and associated pits (Table 34). Bone was found in three of the eight pits. The faunal assemblage suggests that the pit fill was domestic refuse mixed with scatological bone.

Feature 30 has a large number of bones from a large mammal. Elements include pieces of ribs, skull, and long bones. Taxa with rounded specimens include two species of rabbits (*Lepus* and *Sylvilagus*), medium-sized rodents, small mammal, and a bobcat (*Felis rufus*) bone. Burning is scarce, and only cottontail rabbit (*Sylvilagus* sp.) is represented by less than fully mature animals.

Feature 32 has the largest sample, consisting largely of rodent (47.8 percent) and potential rodent remains (small mammal=27.4 percent). Nearly all of the taxa have rounded specimens. Burning was noted for both species of rabbits, artiodactyl, large mammal, and the bird/small mammal taxon. One of the medium-sized rodent bones is discolored as if scorched; otherwise, no rodent bones are thermally altered. This, in combination with the rounding, suggests many of these are scatological. The only indication of possible human use of rodents is a fibula of a large kangaroo rat (*Dipodomys spectabilis*) that appears to have a portion cut from the shaft. It, too, is rounded.

The largest proportion of carnivore gnawing and a large amount of rounding was found on the Feature 36 assemblage. Gnawing was observed on elements from a mule deer (*Odocoileus hemionus*), a large bird, a large mammal, and a bobcat (*Felis rufus*) mandible. Taxa with rounded specimens included both rabbit species, woodrat (*Neotoma* sp.), small mammal, and large mammal. Both species of rabbits are represented by immature and young adult elements.

The assemblage from the general fill (Features 27 and 40) was largely unidentifiable rounded fragments from small animals. Taxa with rounded bone include both rabbit species, small mammal, medium rodent, and medium to large mammal. One of the large mammal specimen exhibits a small cut perpendicular to the shaft.

Antechamber. Feature 25 produced relatively few bones (Table 35). Most are from floor fill. The single floor-contact specimen is a small mammal long bone shaft fragment, which, along with seven specimens from possible pit fill, were lumped with the floor fill in Table 35.

More burned bone was found in the fill (23.1 percent) than in the floor fill (9.7 percent), suggesting that much of the bone was on the roof when the structure burned and was deposited in the fill, or that loose sand on the floor protected floor bone from burning. When broken down by taxa, the burned bone from the floor fill is predominantly from small economic species (rabbit, small mammal, and small to medium mammal), plus a piece of burned antler. In the fill, more of the burned bones are from larger body sizes (Cervidae, large mammal, and very large mammal), with single elements from both rabbits and small mammals. This suggests either the fill bone was cached on the roof or that collection procedures (not screening the upper fill) account for the pattern.

Rounding is fairly common. It was found on bones of both rabbit species, woodrat, small mammal, small mammal/large bird, small to medium mammal, large mammal, and very large mammal. Burning was found on specimens from both rabbits, small mammal, small to medium mammal, Cervidae, large mammal, and very large mammal. The immature and less than mature elements include postoccupational rodents and two jackrabbit bones from floor fill.

The single identifiable *Bison bison* bone, a complete first phalanx, from the project came from the fill of the antechamber. A number of unidentifiable fragments from very large animals could not be identified as bison. Berman (1979:39) reports bison was found in the assemblage from the 1972 excavations at LA 5407.

Main chamber. Feature 39 produced a relatively small amount of bone (Table 36). Few are from rodents (18 or 7.7 percent), compared to larger numbers of the economic taxa (rabbits=29.1 percent, artiodactyl and large mammal=33.9 percent), suggesting household refuse, stored food, or raw materials.

The amount of burning is high at 42.7 percent, as is weathering (9.2 percent). The latter probably results from the proportion of larger bones rather than indicating open or slow fill conditions. Rounded and carnivore gnawed bone are similarly sparse and occur primarily on specimens from the structure fill. Punctures were observed on large-bird and cottontail elements.

Few bones are from less than mature individuals. An immature cottontail element was recovered from the fill and a probable postoccupational intrusive rodent (pocket gopher or *Thomomys bottae*) bone from the floor fill. Only seven young adult elements were identified. One from a jackrabbit and one from a large rodent are from the fill, and two jackrabbit elements, a *Peromyscus* skeleton, a small rodent, and a small mammal element are from the floor fill.

Several instances of butchering marks and evidence of tool manufacture were found. An antler tine has four chops across the shaft; a pronghorn (*Antilocapra americana*) metacarpal has three small cuts just above the condyle and perpendicular to the shaft; a jackrabbit femur was cut in half at midshaft with a beveled cut; a jackrabbit metatarsal has a piece cut off and small marks that might be cuts are perpendicular to the shaft; and a large mammal long bone shaft fragment from the floor has three cuts perpendicular to the shaft.

Wear suggesting use was observed on four elements. A piece of an artiodactyl metatarsal shaft and a large mammal long bone shaft fragment has striations. Another large mammal element, a vertebral process fragment, has all its edges rounded and polished from use. Finally, a large mammal rib shaft fragment found in a storage pit is unmodified but has rounded edges.

Worked Bone

A number of tools were recovered. Some were reconstructed from pieces found in more than one provenience, suggesting they fragmented in the heat of the burning structure. Most of these are awls or tubes, but ornaments are also represented (Table 37, Fig. 27). Nearly all are burned, with the exception of the stirrer (FS 39-784), one tube (FS 39-187), and the antler tine (FS 39-68).

All but two of the awls are from the southeast quadrant of the main chamber and suggest an activity area. The other objects were scattered throughout the structure. Artiodactyl metapodials are the most common element utilized for awls. The only other taxa represented are a large-bird

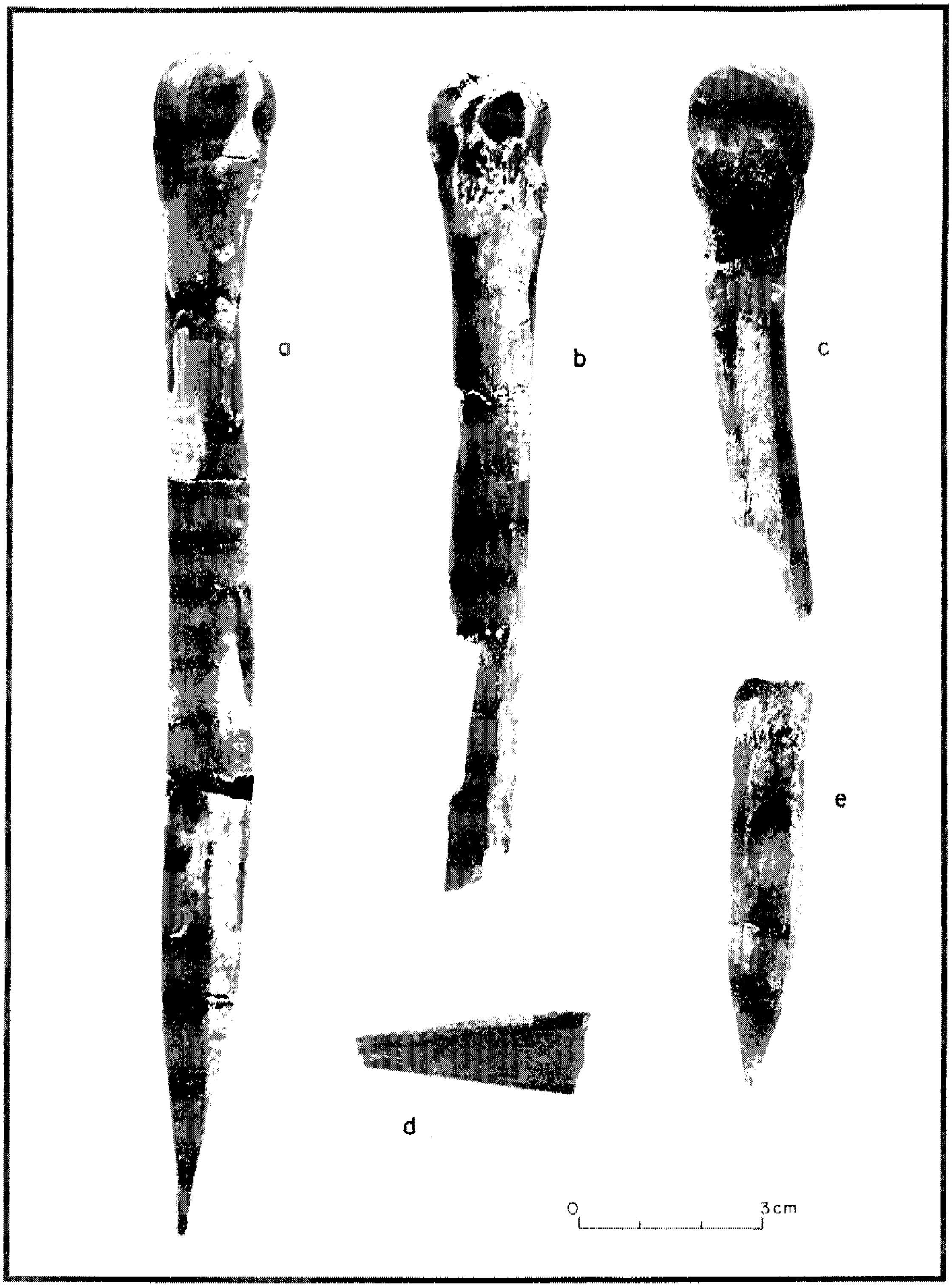

Figure 27. Bone tools, LA 5407: (a) FS 39-639; (b) FS 39-618; (c) FS 39-593; (d) FS 39-592; (e) FS 39-221.

femur used to make a tube or bead and a jackrabbit metatarsal used to make an awl.

Previous Work

Berman reports that "cottontail, jackrabbit, deer, antelope, bison, lynx, pocket gopher, and raven" were recovered from the earlier work at LA 5407, but the source she cites does not contain this information.

Conclusions

The recovered assemblage suggests that, like most Pithouse period groups, the inhabitants of LA 5407 primarily utilized rabbits and artiodactyls for food. The rodents were predominantly postoccupational intrusives or were captured and eaten by dogs. The dog burial confirms that dogs were kept and probably were responsible for the rounded bone. Evidence for the use of birds was sparse. No egg shell was collected, and there was only one definite turkey (*Meleagris gallopavo*) bone. Given the absence of bone and egg shell, this is probably from a wild turkey.

A range of artiodactyls is represented. Deer (*Odocoileus hemionus*) and pronghorn (*Antilocapra americana*) are similar in the number of elements recovered and the MNIs. The bison (*Bison bison*) phalanx and the very large mammal remains confirm use of this species. Elk (*Cervus elaphus*) was not identified; however, one of the antler pieces is large enough that it could be from an elk.

Conclusions regarding the relative use of species are difficult given the relatively small sample size and collection procedures. The LA 5407 residents exploited both species of rabbit, few squirrels, and a variety of artiodactyls. Warm-season use is indicated by the less than mature individuals.

Macrobotanical Summary

Macrobotanical remains from Quemado Alegre indicate a heavy reliance on stored domestic crops--corn, beans, and squash--at a relatively early date. In addition, preservation aided by the catastrophic fire preserved large quantities of wild plants, including goosefoot, sunflower, pigweed, and winged pigweed. This assemblage, as analyzed, provides detailed information on activity areas resulting from storage, processing, and the use of food products in an Early Pithouse period household (Toll and McBride, this volume).

Discussion

While Feature 39 is fairly large for a Mogollon structure of this age, it is within the range of variability found at the SU site (Martin 1940, 1943; Martin and Rinaldo 1947). House A at SU was a kidney-shaped structure with a maximum diameter of 10.4 m and an area of 84.9 sq m. It was excavated 56 to 84 cm below the prehistoric ground surface and had few features: a circular hearth, three small pits near the hearth, and five log-shaped grooves near the perimeter (Martin 1940:14). House V was similarly shaped but deeper, with a diameter of 10.0 m and an area of 78.5 m. No firepit or floor grooves were found; however, there were four pits and 16 postholes (Martin and Rinaldo 1947:304). Anyon (1984), like Wheat (1955:57), considers House A and House V to be communal structures based on size and specialized features such as the grooves. Other northern

Mogollon communal structures from this period are found at Bluff (Bluff 5) and Promontory (Promontory B) (Anyon 1984).

Feature 39 had an area of approximately 73 sq m, or 91 sq m with the antechamber, and has several specialized floor features. Most notable are the U-shaped foot drum located south of the hearth, an antechamber, and the large number of interior postholes. Features similar to the floor drum have not been reported for early communal structures. Kayser (1975:15) reports a Pine Lawn phase pit structure with a foot drum at a Gallita Springs site (LA 6082). He felt that the shallow structure (Feature 27), which measured approximately 5.0 m in diameter, was a domicile that was also used for ceremonial functions. Floor artifacts included a metate, mano, maul, and brown ware ceramics (Kayser 1975:42). Another foot drum at Gallita Springs was in a Three Circle phase pit structure at LA 6083 (Kayser 1975:16). A Three Circle phase pit structure from the Whiskey Creek project (LA 4986) also had a foot drum (Kayser 1972b:5). The structure was deep and rectangular with rounded corners and measured approximately 4.2 by 3.8 m. The foot drum was not described, but from the map it appears rectangular and approximately 1.25 m long and 0.4 m wide. Another foot drum was located at LA 4987 in a rectangular pithouse-kiva thought to date to the Apache Creek phase. The drum was rectangular and partially stone lined. It measured approximately 1.7 by 1.0 m (Kayser 1972b:7).

Antechambers are generally considered an Anasazi trait (Martin 1943:130). The antechamber at LA 5407 is not typically Anasazi in shape, orientation, or the means of entry. It does resemble the elongated lateral entrance of SU site House D (Martin 1940:22) and Surface House 3 (Martin 1943:157). The latter was shallow. It was excavated from 0 to 40 cm and had a large number of postholes. Also similar is what Smith refers to as a broad entryway with deeply sinuous or scalloped walls in Feature 13 of the Williams site. Feature 13 was 3.4 by 4.0 m in diameter, and the entryway was 2.0 to 2.4 m long (Martin 1973:12). These structures suggest that the LA 5407 antechamber is yet another variation of a Mogollon entryway.

Hunter-Anderson (1980) included SU site Houses A and V in her analysis of ten sites in the Reserve area and seven sites from the Upper Little Colorado area. A factor analysis of artifact associations isolated several groups of structures based on assemblage content. House A was the only structure interpreted by Hunter-Anderson (1980:168) as mainly sociological in function, perhaps an intercommunity gathering place. House V was interpreted as general residential or falling into the category of kivas or "mens houses" (Hunter-Anderson 1980:170).

Feature 39 has many of the same types of artifacts found in the two SU site structures. House A contained a metate, maul, projectile point, knife, worked sherd, and a mortar. In House V were a mano, rubbing stone, metate, pestle, hammerstone, chopper, maul, polishing stone, projectile point, knife, worked sherd, scraper, and a mortar (Hunter-Anderson 1980:244). House V had burned, leaving a larger artifact assemblage (Martin and Rinaldo 1947:304). It seems reasonable to conclude that these large early structures served a number of purposes, including both domestic and ritual functions.

Because Feature 39 burned and was abandoned with the majority of the household goods left in place, it provides a complete assemblage of artifacts. Unfortunately, the excavation methods, the quantity of material recovered, and the number of years between the excavation and analysis have lessened the data potential of the feature. Many of the artifacts are without level provenience, some of the bags are faded and cannot be read, and other material has been lost or discarded over the years.

An impressive amount of the material was recovered from the floor fill and floor of the structure. Table 38 summarizes much of the structure contents. Materials labeled inner or outer zone, and those with point proveniences are assumed to represent floor fill or floor contact, even though many had no level recorded. Actual artifact counts are used whenever possible. It is clear that some artifacts have been lost, and since lost artifacts cannot be distinguished from those that were misidentified on the field specimen sheets or discarded, better information from the analyses is used. Other categories, especially the macrobotanical counts, do not include vessel contents unless the contents were listed separately on the field specimen sheets, which was rare: vessel contents were usually designated as flotation samples. Similarly, the wooden tool counts are used, even though I doubt that any of these artifacts were worked.

Quadrants and zones are the smallest consistently recorded horizontal provenience (Fig. 28). The intense heat from the burning of the structure melted some artifacts and displaced others. Metates were reconstructed from pieces found in adjacent quadrants: one from pieces found on the floor of the southeast and northeast quads, and another from the floor in the southeast, southwest, and northwest quads and in Feature 28. Similarly, vessels were reconstructed from sherds found in different quads. One composite vessel was constructed of sherds from the southeast and southwest quads, the west half, and from 1.35 m below the modern ground surface down to floor contact. Exploding vessels may have strewn their contents into adjacent quadrants.

Regardless, there is clustering of some materials that indicate activity areas (Fig. 29). Most of the vessels were in the north half of the structure (18 of 24) and were evenly divided between the northeast and northwest quads. Lithic tools were more or less evenly spread throughout the antechamber but favored the brittle materials and tools used primarily for animal processing. All five cores were from the northeast quad of the main chamber, which also had the largest debitage and lithic tool totals, suggesting tool production near the hearth.

Much of the ground stone from the antechamber (9 of 15 pieces) was in the northwest quad and was probably stored. Manos were especially numerous in the northwest (n=7) quads of the main chamber. This, combined with the distribution of whole metates, indicates grinding areas in the northwest quad at the juncture of the northeast and southeast quads, and in the southeast quad. Lapidary stones were primarily found in the southeast quadrant along with basketry, matting, and awls, suggesting a plant or animal hide processing area. Polishers and mauls were spread throughout the main chamber.

Since unprocessed meat spoils rapidly, waste such as bone is discarded or burned. Bone remaining in a structure is potentially useful or is in small pieces that escape routine cleaning activities (Hayden and Cannon 1983:126). Small animal bone, primarily rabbit, clusters around the Feature 39 hearth in the northwest and southwest quads and in the antechamber, where initial processing may have occurred. In contrast, large mammal bone is predominantly from the southwest quad, where it may have been stored for making tools. Comparing the floor and floor-fill assemblage from the structure with that from trash-filled exterior features indicates that large-mammal bone was not routinely discarded with domestic trash and may have been cached.

Sandal fragments were most frequent in the northeast quad (n=20), followed by the southeast quad (n=10). Eleven of the 15 basket fragments, representing at least nine baskets, were from the south half of the main chamber. Corn in various forms was found throughout the structure.

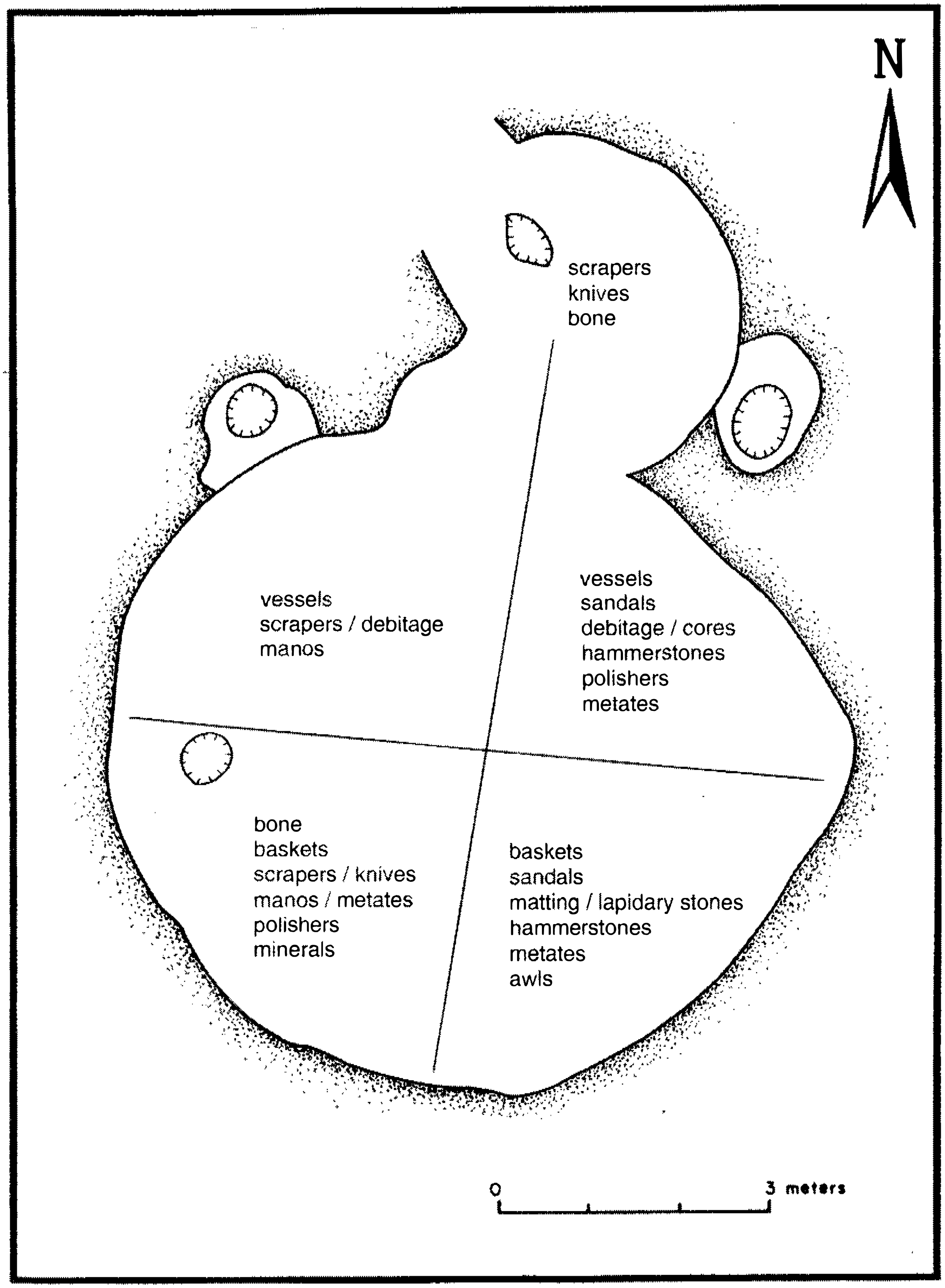

Figure 28. Distribution of artifacts, LA 5407.

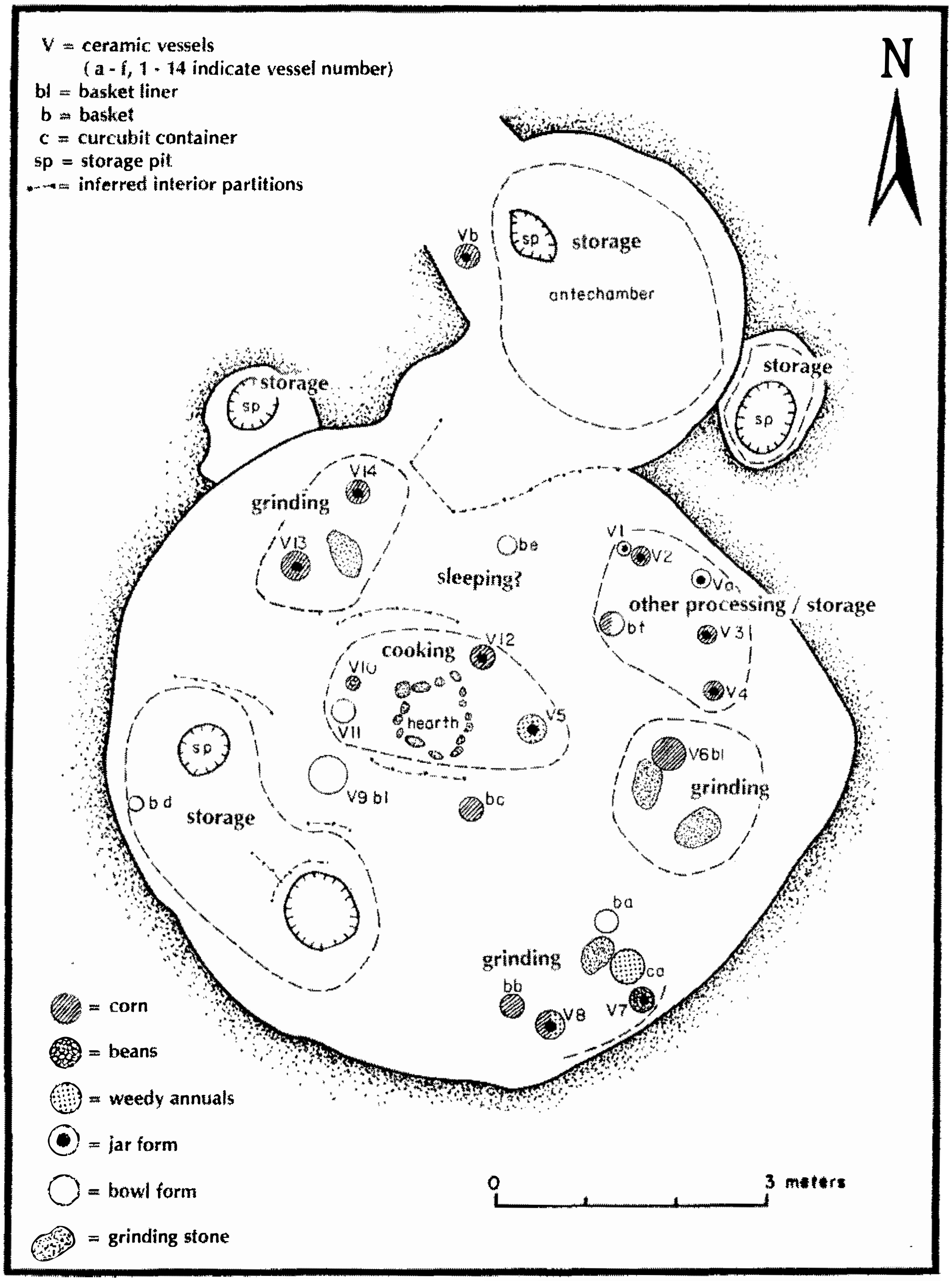

Figure 29. Activity areas defined by cultural remains and features, LA 5407.

Ornaments and items of potential ceremonial significance are least numerous in the northwest quad (n=2). Much of the pigment was found in the northeast quad (10 of 25 pieces). All six pieces of shell (only three of which could be located for analysis) are from the south half of the main chamber. Pieces of wood recorded as tools or possible wooden tools were mainly from the southeast quad (7 of 11). If these are tools, they could be functionally related to the awls and lapidary stones from that quadrant.

The artifact assemblage suggests a wide range of activities took place in the structure. Many have domestic functions such as food preparation but also include cutting and scraping activities and lapidary work. Few objects suggest a ceremonial function: two stone pipes, the mica, and the quartz crystal. The size of the structure and the foot drum provide the best evidence for other than domestic activities.

Virtually every aspect of the Quemado Alegre subsistence remains, architecture, and material culture shows that agriculture was more than a supplemental strategy for at least a portion of the Early Pithouse population. Not only is corn abundant and stored in large quantities, but the ground stone assemblage is characterized by great uniformity in specialized grinding tools. Likewise, lithic artifacts are dominated by durable materials and tool types used in plant processing. The predominance of rabbit bone suggests garden hunting while the inhabitants protected fields from agricultural pests.

LA 6074

LA 6074 is situated on a flat ridge within a piñon-juniper parkland. It is 490 m east of Largo Creek at an elevation of 2,224 m. The soils are thin gravelly to rocky forest humus (Kayser 1976:11).

Cultural Remains

This site was recorded in 1972 as a possible pithouse depression with a light trash scatter. Surface sherds included a few Alma Plain and several Reserve Corrugated (Kayser 1976:11). Limited testing in form of three 1 by 1 m test pits indicates that no subsurface materials exist within the right-of-way. The main part of the site, consisting of three possible pithouse depressions, is 25 m to the east (Kayser 1973:17).

The portion of LA 6074 tested during the Gallo project is approximately 40 m south of the 1972 tests. The area includes several historic features, probably representing a small sheep or goat herding camp that postdates 1880. The historic features include a slat trough fashioned with a steel axe, lean-to poles, and scattered corral poles (Kayser 1976:11). The historic component overlies a rubble concentration and sparse sherd and lithic scatter thought to represent an eroded two-room fieldhouse.

Excavation Methods

Provenience control was established through a grid system centered on the rubble concentration. Testing consisted of 12 strips, 1 m wide and 10 m long (Fig. 30). The strips were numbered Feature 1 to Feature 12. The eastern portion of the rubble was called Feature 13, and the western portion was called Feature 14.

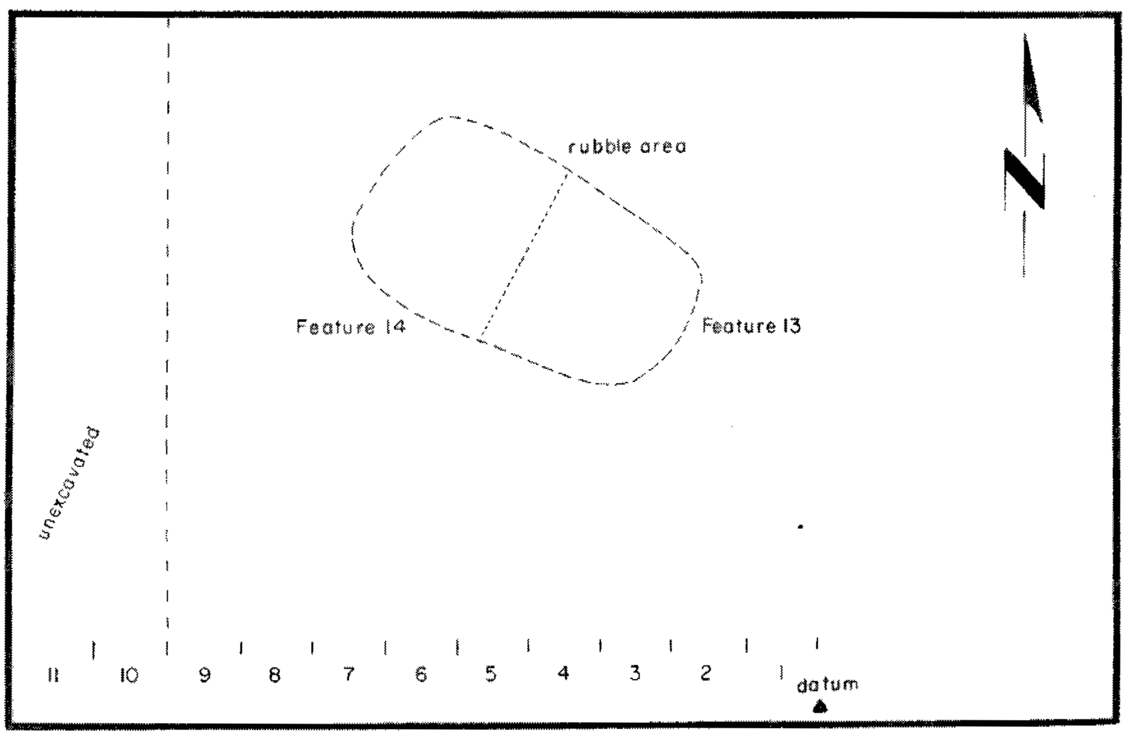

Figure 30. LA 6074 site map.

Surface materials were shovel-stripped from Features 1-9 in 10 cm levels. Only the material from Features 13 and 14 was screened. Upper fill was a uniform brown clayey soil with abundant rootlets and varying amounts of rock (Table 39). Below 25 cm, soil was a lighter brown crumbly clay similar to the layer that overlies the volcanic ash at LA 14858. A white sterile layer with protruding rock was located in the northern corner of Feature 14 at 40 cm below the modern surface. Excavations failed to uncover convincing evidence of walls or a use-surface in the rubble area.

Cultural Material

Cultural material was sparse, consisting of two flakes, one basalt and one rhyolite, and 12 sherds. All but one of the sherds are from the surface or first level of fill and are from the Reserve series (Table 40).

Summary

The paucity of cultural materials and lack of evidence of walls suggests that the rubble is a natural feature. There is a clear view of a park area to the north and a valley to the south, and the area may have served as lookout or camp.

LA 6075

LA 6075 is on a flat-topped ridge 275 m east of Largo Creek at an elevation of 2,230 m. The center of the ridge is an open grassy area with occasional piñon and juniper. Major vegetation around the parkland is piñon, juniper, occasional yellow pine, narrow leaf yucca, oak, and grasses. Soils are fairly deep at the center of the ridge and thin and rocky along the ridge edge (Kayser 1976:16-17).

Cultural Remains

Recorded by Kayser during the 1972 right-of-way survey, LA 6075 was described as a single rectangular depression with possible surface structures and little trash in an area of 10 sq m. The 1976 resurvey identified the site as covering the entire ridge top. Recorded features include a deflated firepit, Archaic, Cochise, or Early Mogollon in date; an extensive pithouse component comprised of seven circular depressions in an area of 9,000 sq m, probably of the Pine Lawn phase; and two rectangular rock alignments indicating two separate two-room fieldhouses, with a total area of 200 sq m, dating to the Reserve phase. The portion of the site within the right-of-way was the firepit, four pit structures, and one of the fieldhouses (Kayser 1976:19).

The Gallo excavations uncovered an Early to Late Pueblo period pit structure and four rooms. The rooms were eroded and disturbed and represent a masonry and jacal roomblock of undetermined size. The area recorded as a fieldhouse was, at best, a cleared area.

Excavation Methods

Fieldwork was carried out between October 25 and March 3. Weather conditions were less than ideal, alternating between frozen ground and mud. Structures were located by trenches and strip areas of varying sizes, excavated in 15 cm levels. Screening was done in portions of the structures, artifact concentrations, or when conditions permitted.

Feature Descriptions

Test Units

Figure 31 shows the test units in relation to the major features and plans of the structures. Information on the test units is summarized in Table 41.

Pit Structure

The walls of Feature 16 were located 60 cm below modern ground surface. Excavation revealed a structure much smaller than surface indications suggested. Overburden was removed as test trench fill. Neither the trench fill nor the structure fill was screened.

Two cross trenches defined the limit of the structure by locating the floor and expanding to the walls. Except for three balks left for controlled excavation, fill was removed in 50 to 100 cm levels as east, west, or general fill. The balks were 0.25 m by 6.0 m and were excavated in 25 cm levels. Pollen and flotation samples were collected from the balks, and the remaining balk fill was

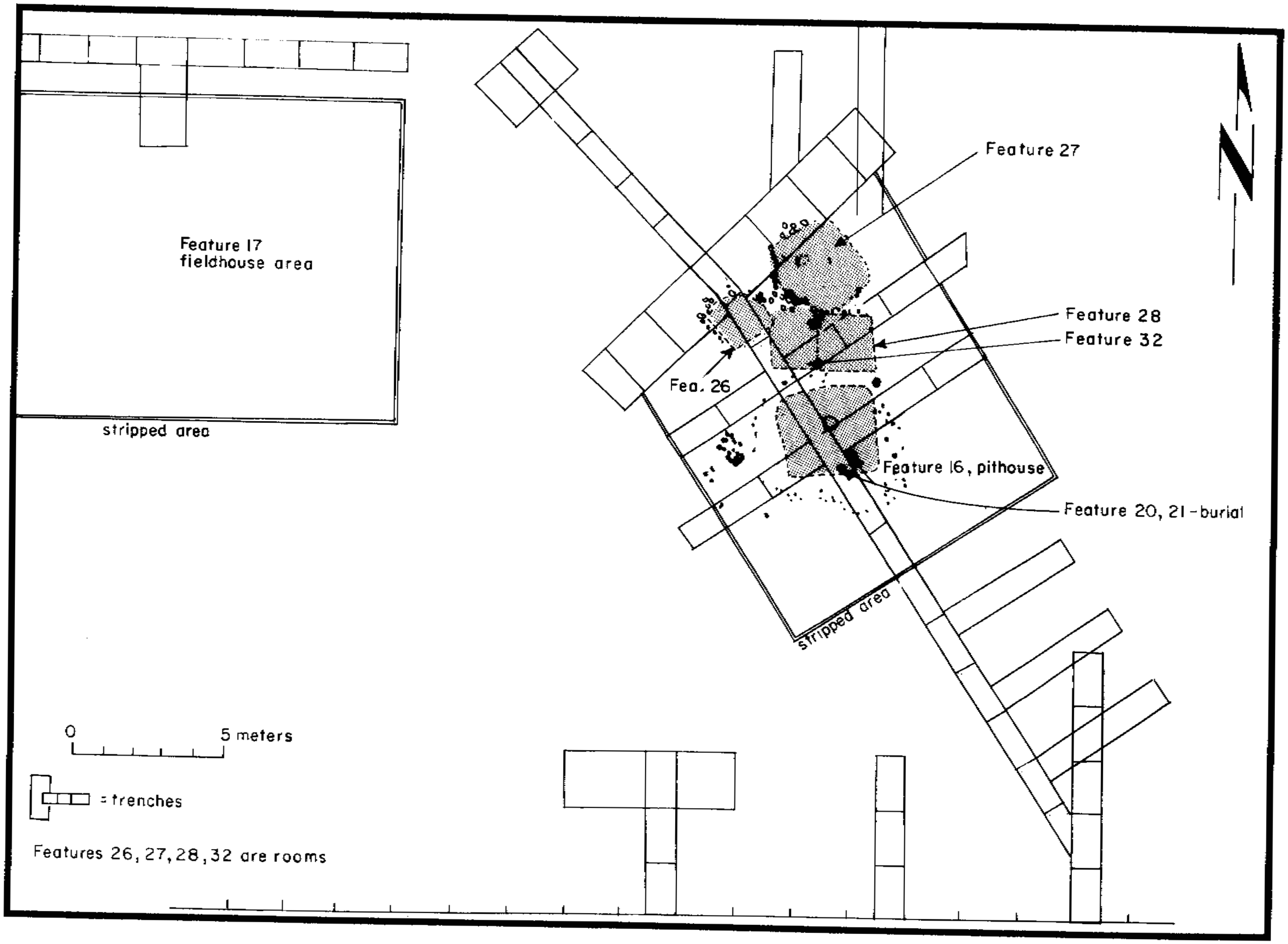

Figure 31. LA 6075 site map.

screened. After removing the general fill, a 1 m grid system was laid out, and floor and floor fill materials were removed by grid.

The upper fill of the structure consisted of alternating lenses of sand and silt, some with thin bands of charcoal. The middle portion was similar but had chunks of volcanic tuff mixed with the laminated sands and silt. Toward the bottom the layers were thicker and darker in color, and they contained trash. Resting on the floor was a dark layer of organic soil 3 to 7 cm thick. Scattered human bones found between 90 and 95 cm below the surface (Features 20 and 21) represent a disturbed or secondary burial.

The pit structure (Fig. 32) was rectangular and measured 4.0 by 3.5 m, with a floor area of 14 sq m. The ventilator was to the northwest, and the floor was roughly 2.2 m below the present ground surface, 1.0 to 1.7 m below the prehistoric ground surface.

Walls were excavated into an off-white volcanic tuff and plastered. The floor was unplastered and use-compacted. Roof construction could not be determined. Two large postholes found in the northwest corner and the center of the west wall may have served as primary roof supports.

Floor features were sparse and include a hearth, three postholes between the hearth and vent, the two postholes along the west wall, and a pot rest. The hearth was an unplastered circular pit roughly 50 cm in diameter and 25 to 30 cm deep. Fill consisted of an upper layer of ash overlaying an orange layer that may indicate a later use of the hearth. The lower fill was dark ash. The rim of the pit was fired to a depth of 3 cm. There was little evidence of firing on the floor of the hearth.

The three small postholes between the hearth and vent are probably the remains of a deflector. One pole was in place and extended approximately 25 cm above the floor level. Two larger postholes were found the along the west wall. The larger of these had a chink along one side. Both were 30 to 40 cm deep. No diameters were recorded.

A pot rest was located west of the hearth, but no dimensional information was recorded. The ground surface opening of the ventilator measured 0.30 by 0.85 m, and the tunnel was 1.5 m long. The vent opening in the north wall of the structure was 0.58 by 0.40 m. Vent fill consisted of compacted sand and clay with some trash. Floor contact artifacts include a mano and hammerstone in one corner and an awl in another. Floor sherd types are primarily from the Reserve series: Reserve Black-on-white, Reserve Indented Corrugated, Reserve Plain Corrugated, and Reserve Smudged, plus one Tularosa Black-on-white sherd.

Clearing around the structure revealed a large number of postholes, 25 cm below the present ground surface. The postholes tended to be of two sizes, the larger measuring 35 cm in diameter and the smaller ones 10 to 15 cm. The excavators interpreted the postholes as a shallow Pine Lawn phase structure 5.0 to 5.5 m in diameter. The posts form a circle around Feature 16 with a possible lobe on the south side. No evidence of floors or walls was found. The excavators attributed this to erosion or destruction by the later structure.

There is little, if any, evidence to support the existence of an earlier structure. The profile of Feature 16 cuts more than 80 cm into earlier deposits (Fig. 33), and the stratigraphy does not suggest another structure. Nor were there artifacts definitely associated with this proposed Early Pithouse component. An alternative explanation is that the postholes represent the roof supports

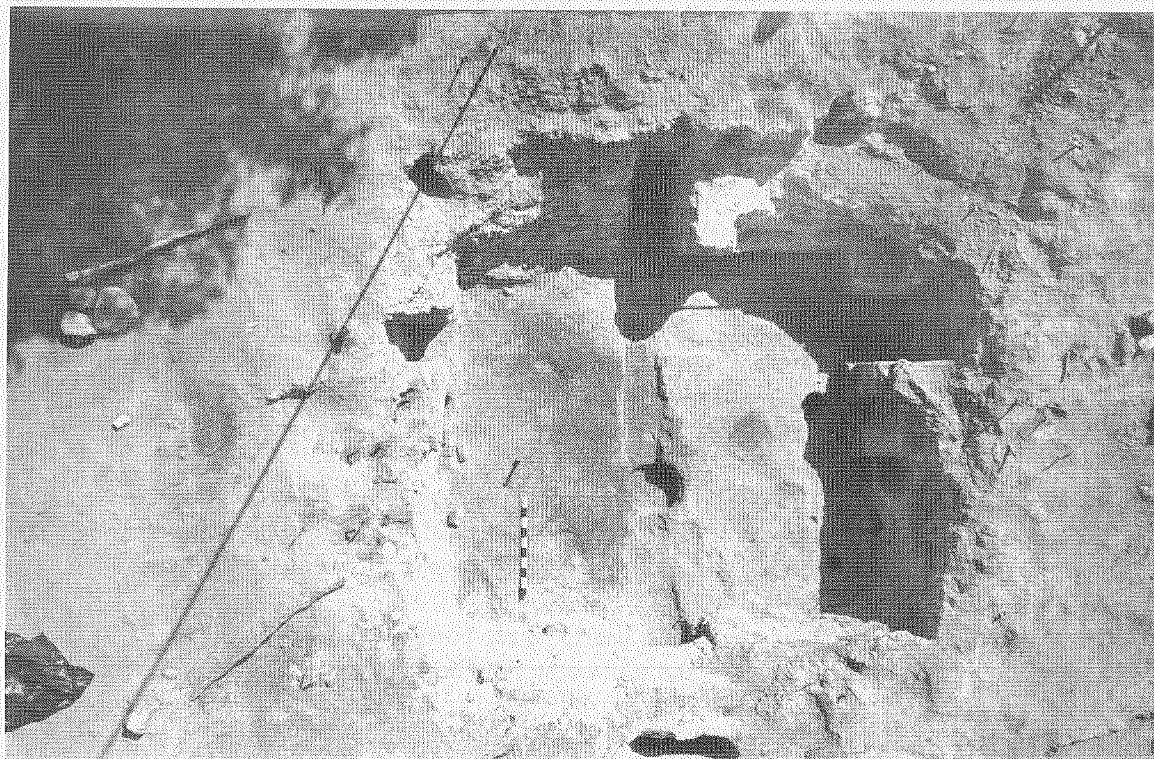

Figure 32. Feature 16 after excavation, LA 6075.

Figure 33. Feature 16 during excavation, LA 6075.

for Feature 16. Unfortunately, no information was recorded on the size, exact location, or angle of the posts.

Rooms

Northwest of the pit structure was a tumbled rock alignment. When trenching failed to reveal evidence of walls, all rock that did not appear to be in place was removed. Since few rocks were in place, the rooms were eventually defined by locating a floor and tracing outward to the walls.

Feature 27 had two fairly well-defined walls, the southwest and southeast walls. These measured approximately 2.1 and 3.1 m long. Construction was stacked unshaped boulders, and the maximum remaining wall height was 28 cm along the east wall. Room fill was forest loam with charcoal. The floor, located 30 cm below the modern ground surface, was completely eroded and appeared to have been excavated into sterile tufa. It may have been plastered.

Feature 27 had two floor features, a hearth and a depression in the south corner. The hearth was a circular slab-lined depression with slabs extending above the floor level. It varied between 55 and 65 cm in diameter and was 14 cm deep. The corner pit was quarter-circle shaped, measured 35 by 40 cm, and was 12 cm deep.

The presence of cobbles in the room fill suggest cobble walls. No evidence of a roof or roofing type was found. No postholes were observed.

Feature 28 was southeast of Feature 27 and just north of the pit structure vent opening. The north and west walls were partially intact and measured 2.05 and 1.90 m. The estimated lengths of the east and south walls are 2.45 and 2.05 m. The upper 20 cm of fill was forest loam with trash. Below this and down to the floor, 40 cm below ground surface, was almost sterile. The floor was eroded and poorly defined sterile loam that may have been plastered. A posthole was found in the southwest corner (11 cm in diameter and 8 cm deep), but it is most likely associated with the row of posts around the pit structure. A single course of cobble masonry remained in the northwest corner. No evidence of a roof or roofing was found.

Feature 32 was west of, adjacent to, and slightly offset from Feature 28. The north and east walls were partially intact and measured 2.2 by 1.75 m. Construction was of stacked unshaped rock. The excavator suggests that part of the east wall was jacal due to the posthole in Feature 28. However, since that posthole was probably associated with the pit structure, this is unlikely. The west wall may have been partially formed by the east wall of Feature 26. Maximum wall height was 38 cm in the west wall.

Fill was the usual forest loam overlying sterile tufa. The floor was 40 cm below the surface and was in poor condition with no evidence of plaster. No floor features were found.

Feature 26 was located west of Feature 32. It is one of the better-defined rooms. It had cobbles along portions of three walls and a depressed floor area. The cobbles suggest wall lengths as follows: north 1.55 m, south 1.75 m, east 1.90 m, and west 1.55 m. The depressed area of the floor measured 1.0 m along the north, 1.2 m along the south, 1.42 m along the east, and 1.2 m along the west edges. It was 30 cm below the floor level in the rest of the room.

Walls were of stacked cobbles ranging from 10 to 40 cm in diameter. The maximum wall height was 75 cm in the southwest corner. Two postholes (14 and 12 cm in diameter and 11 and 8 cm deep) in the southeast corner suggest a jacal wall segment. No other features were found.

The first 15 cm of fill was a dark forest loam overlying dark trashy fill. The floor was 80 cm below ground surface, and Reserve Incised Corrugated, Reserve Black-on-white, and Reserved Smudged sherds were found on the floor.

Exterior Firepit (Feature 3)

Ten meters northwest of the structure was an isolated firepit, bisected by Feature 1. The firepit was a rock-filled circular basin roughly 50 cm in diameter and 15 cm deep. Rock was fire-cracked, and fill was a charcoal-darkened soil. Around the firepit was a dense concentration of fire-cracked rock covering an area 1 m in diameter and extending 25 cm below the surface. Ash and charcoal from the feature covered an area 2 m in diameter.

Feature 17 (Cleared Area)

The area northwest of the pit structure, originally thought to be a fieldhouse, was bisected by two trenches (Features 13 and 34). It proved to be a level area with a natural rock outcrop or alignment downslope. Soil consisted of a thin layer of forest loam with sterile tuff at 7 to 15 cm below the surface. It seems unlikely that this 4.5 sq m area was a garden area, as suggested by the excavators, due to the lack of soil.

Features 20 and 21 (Human Bone)

Scattered human bone in the fill of the pit structure was given two feature numbers. Feature 20 is the parts found at the approximate center of the feature and 40 cm above the floor. Elements included five rib fragments and two femur fragments. Feature 21 was slightly deeper and includes major parts of both tibiae. Their proximity suggests a single individual.

Cultural Material

Ceramic Distribution

A total of 624 sherds were recovered from LA 6075. Brown ware body was the largest category (43.1 percent), followed by Reserve Plain Corrugated (10.6 percent), Reserve Black-on-white (9.8 percent), and brown ware body with smudged interiors (9.4 percent). Wares cover a span of time; however, there was no spatial clustering of wares. The Alma Plain and San Francisco Red distribution is quite similar to the later wares such as St. Johns Black-on-red, Tularosa Black-on-white, and Tularosa Patterned Corrugated (Tables 42-45). Similarly, the indented white wares and Cibola white wares have a wide distribution. Overall, the wares suggest an occupation between A.D. 1100 and 1250.

The pit structure produced the largest number of sherds, 228, or 36.5 percent of the site assemblage (Table 42). San Francisco Red and Tularosa Black-on-white were found just above or on the floor. Only one indented white ware sherd was found in the floor fill. Plain brown ware, Reserve Plain Corrugated Neck Banded, Alma Plain, and Cibola white ware sherds were found in the hearth.

The next largest sample is from Feature 33, a trench in the trash area (Table 43). Among these was a restorable Alma Incised miniature vessel found 15 to 30 cm below the surface. Few sherds were recovered from the rooms (Table 45). Feature 26 has the largest sample, 60 sherds. Tularosa Patterned Corrugated was found in three of the four rooms.

Several of the Reserve Black-on-white sherds are decorated in a Puerco design and two others in a Red Mesa design style. Rim shapes include direct tapered and direct rounded. At least one Reserve Black-on white dipper was present (Rayl n.d.).

Ceramic artifacts from LA 6075 include six worked sherds, which may have functioned as scrapers. Four are from the pit structure. Two made from brown ware body sherds were found in the general fill. Another brown ware body sherd is from floor fill. And a San Francisco Red sherd is from a balk flotation sample. The other two are a St. Johns Black-on-red sherd from the trash area and an unidentified black-on-white from Feature 12.

The ceramic analysts recorded only the rim and neck sherds as jars for at least the brown ware body sherds and possibly other categories (Table 46). The rest are called bowl sherds. This is the only site for which this was done, making it difficult to compare vessel forms.

Lithic Summary

The lithic assemblage consists of 120 flakes, 19 angular debris, 33 tools, and 7 cores. Tool types include shavers, knives, drills, choppers, and projectile points. Rhyolite is the most common lithic material (Wening, this volume).

Ground Stone, by Charles A. Hannaford

A total of 16 ground stone artifacts were collected from LA 6075 (Table 47). The artifacts were manufactured from basalt (n=11), vesicular basalt (n=2), and sandstone (n=3).

Manos. This class is represented by four two-handed manos, only two of which are complete. The two-hand manos are subrectangular slabs with rounded corners. Two have grinding on two surfaces, and two on one surface. The specimens were made from slabs of basalt (n=3) and sandstone (n=1). The complete manos range in length from 13.3 to 15.4 cm, in width from 9.7 to 11.3 cm, and in thickness from 2.4 to 5.0 cm. Both of the complete manos exhibit battering wear on one or more of their ends or sides. End grinding and ground surface contour indicate that the two manos were used on trough metates; the other two are indeterminate. The two-hand manos were probably used primarily for maize processing. The pit structure contained two specimens, a partial vesicular basalt mano from the general fill and a complete mano from the floor.

Rubbing Stones. Two unaltered water-worn cobbles were assigned to this category. Both stones are oval in outline, measuring 8.6 by 7.8 by 3.3 cm and 8.1 by 7.0 by 5.1 cm. One specimen has two finely ground surfaces exhibiting traces of red pigment. Battering wear on the ends indicates secondary use as a hammerstone. This rubbing stone was recovered from the general fill of the pit structure. The other stone has one ground surface with a dark grain stain. Rubbing stones have a wide range of uses in the production of other objects. The examples from the site appear to be pigment processing tools.

Metate. A single small trough metate fragment was recovered from a nonfeature provenience.

The metate was manufactured from sandstone with a trough depth of 2 cm. It could not be determined whether the metate had an open or closed trough.

Lapstones. Three unmodified water-worn basalt stones most likely served as base stones upon which seeds or other materials were ground or pulverized. The stones are irregularly shaped, exhibiting light grinding wear on one surface. Dimensions range from 12.0 to 17.5 cm in length, 9.8 to 12.0 cm in width, and 4.7 to 8.1 cm in thickness. Red pigment is apparent on the ground surface of the specimen recovered from the general fill of Feature 26.

Maul. A small maul measuring 7.6 by 6.0 by 3.5 cm was made of vesicular basalt. A full groove has been pecked around the center, and both ends exhibit battering wear. The maul was recovered from the general fill of the pit structure.

Miscellaneous. Artifacts in this category could not be assigned to a specific artifact class because of minimal wear or fragmentary conditions. Two unaltered fist-sized basalt cobbles from nonfeature proveniences exhibit slight grinding and battering wear. The three remaining specimens are shaped slab fragments of basalt (n=2) and sandstone exhibiting chipped or ground edges. One small finely ground edge fragment from a nonfeature provenience is possibly a two-hand mano fragment with an edge ground smooth by a trough metate.

Discussion. The small ground stone assemblage from the site is composed predominately of implements for grinding foodstuffs and pigments. The two-hand manos are indicative of maize processing and the agricultural subsistence base. Little can be said about temporal and functional differences between the architectural features because of the small assemblage.

Miscellaneous Artifacts

A number of miscellaneous artifacts were recovered from the general fill of the pit structure. These include several mineral specimens and a shell fragment. A small unaltered piece of malachite was pressed into the wall plaster of the pit structure, and seven small pieces of a very soft wood found in a subfloor pit have parts of the surface coated with a bright malachite-colored pigment. The pieces of wood are very fragmentary, and the extent of the painting and design cannot be determined. The small fragment of shell could not be identified. It is ground on one side and probably represents an ornament. A small piece of red ocher or hematite has one ground surface and appears to have been ground against another object to produce pigment.

Pigment was also found in the gridded area. In grid E2 at 43 cm below the surface was a small sand-coated nugget of red shale-colored material. Another larger nugget (1.5 by 2.4 by 1.2 cm) was found in Feature 15. Neither had wear facets. A cubical lump of clay was found in Grid 6C. It was gray with black inclusions and measured 1.8 cm. A soft white powdery substance, possibly gypsum or calcite, was recovered from Feature 19. It measures 1.6 by 1.4 by 1.3 cm and may have a small amount of wear.

Faunal Remains

A relatively small assemblage of bone was recovered from LA 6075 (n=139) (Table 48). An additional 377 were found in flotation samples, particularly those from Feature 16 (Table 49). Three species of mice were found only in the flotation samples. No carnivores were identified, and the only identifiable artiodactyl elements are a complete pronghorn (*Antilocapra americana*) metatarsal and a naviculo-cuboid. The former has small scratches and cuts in the groove, indicating an effort to split it lengthwise.

For the most part, the numbers are too small to reach any conclusions (Tables 49 and 50). Almost a third of the nonflotation bone was weathered. This suggests poor site preservation if it were not for the large amount of bone found in the flotation samples. Bone recovered with the usual collection procedures tends to be larger and thus more likely to weather.

The distribution of burned bone indicates that while some rodents may have been cooked and eaten, the larger portions are postoccupational intrusives (Table 48). Three partial skeletons were recovered: large parts of a prairie dog (*Cynomys gunnisoni*), a *Peromyscus*, and an unidentified small rodent.

Immature and nearly grown cottontail rabbit (*Sylvilagus* sp.) elements were found throughout the site, as were elements from a nearly grown jackrabbit (*Lepus* sp.), prairie dog, and small rodent. The relative abundance of less than mature animals provides good evidence of warm-weather occupation of this site.

A single piece of bone is carnivore gnawed, and a small number are also rounded, possibly from digestion. These may suggest dogs were kept by the inhabitants. The most unusual find was a set of jackrabbit right mandibular incisors from deep in the fill of Feature 16. All three are cut to the same length.

Bone Tool

A bone awl was recovered from the floor of the pit structure. It was manufactured from a piece of long bone from a large mammal (Fig. 34). The tip is broken, but the surrounding area is highly polished from use. The base is unmodified, and an incised grove for splitting the bone is visible. It measures 12.4 cm.

Human Bone

Scattered human bones were found in the fill of Feature 16 at a depth of 90 cm below ground surface. The elements are from an adult and include a fibula shaft, a left tibia shaft, a right femur shaft, and six rib fragments. The femur and tibia were gnawed, and one rib has a tooth puncture, suggesting the disturbance was due to a carnivore. The size and rugosity of the bones suggest the individual was a male.

Flotation Summary

Flotation samples from the floor of the pit structure produced no economic plants, although the hearth sample had pigweed and squawberry. Room samples contained goosefoot and tobacco. No cultivated plants remains were found (Toll and McBride, this volume).

Summary

LA 6075 is a small Early to Late Pueblo period site consisting of four ephemeral rooms and a pit structure. Tularosa Black-on-white sherds were found on the floors of the pit structure, Feature 26, and in the fill of two other rooms, suggesting a primary occupation between A.D. 1150 and 1200.

Relatively few artifacts were recovered, which in combination with the ephemeral character of the rooms suggests seasonal or intermittent use of the site. The fauna suggest some site use during the warmer months, and the array of plants suggests late fall or summer. The only evidence of cold-weather use may be the presence of the pit structure. However, unless one or more of the rooms were used for storage, there were no storage facilities.

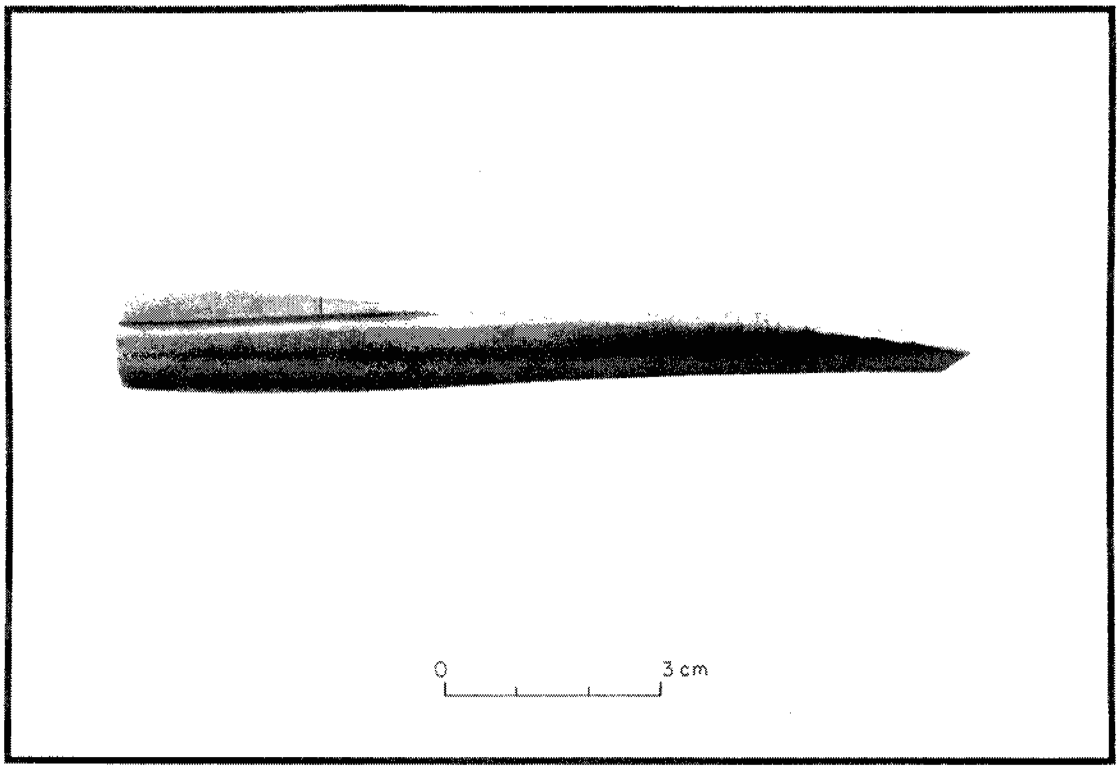

Figure 34. Bone awl (FS 16-147), LA 6075.

LA 6076

LA 6076 is located on the edge of a high ridge overlooking Largo Creek, 260 m to the west. It is at an elevation of 2,231 m, approximately 15 m above the valley floor, and less than 200 m from arable land. The area is a piñon and juniper woodland with grassy parks on the central portion of the ridge. Dense growths of juniper, yellow pine, and mountain oak line the ridge edge and slopes, and cottonwoods are found in the valley bottom (Kayser 1976:20). Rabbitbrush, opuntia, composites, and at least three species of grass were observed at the site. Soils are thin and rocky on the ridge top and slope.

Cultural Remains

LA 6076 was surveyed in March 1972 and again in August 1976. A block of four rooms, partially displaced during a backhoe soil test, and a separate downslope room were recorded. Refuse was noted between the rooms, to the west, and downslope. Reserve Black-on-white, Reserve Plain Corrugated, Reserve Indented Corrugated, Puerco Black-on-white, Wingate Black-on-red, and Alma Plain were observed during the survey (Kayser 1976:20-21).

This hillside pueblo, covering an area of 900 sq m, was entirely within the right-of-way. Extensive subsurface testing located masonry rooms, jacal rooms, two pit structures, roasting pits, a series of check dams, and a possible shrine. The roomblock represents two occupations, each consisting of a pit structure and associated rooms. The masonry rooms appear to go with the later pit structure. The association of the jacal rooms is uncertain due to the paucity of cultural remains.

Excavation

A grid of 2 m squares was imposed over the site area (Fig. 35). Trees were removed from the roomblock area and loose soil striped from about 67 of the grid squares. Loose soil between 5 and 10 cm deep consisted of dusty, dry soil with pine needles and grass. Fill from between 4 and 25 of these grids was screened. Sherds and lithic artifacts were recovered from most. Deeper tests were made throughout the area as well as within the structures. A white caliche layer with fewer artifacts was reached at 25 cm below the surface in Grid 11F. No fill observations were made for the other deeper tests. Kayser (field journal) describes the overall site soils as alluvium and colluvium from volcanic sediments with cultural material overlying a volcanic sediment and, finally, a volcanic conglomerate of cobbles and loosely cemented volcanic sediment.

In addition, an area to the north and west of the roomblock was divided into eight strip zones (Features 1-8) to test an area for backdirt disposal. The 1 by 8 m strips were excavated as deep as 30 cm. Features 1, 2, and 4 were not screened. Fill was loamy-silty soil with abundant rock, pine needles, and grasses. Substantial amounts of trash were encountered, indicating that refuse was thrown downslope. The excavation also revealed a series of three check dams (Moore, this volume).

Another six test trenches were placed north and east of the rooms on a wide flat area to determine if it had been artificially leveled. There was no evidence it had been. Features 45 through 48 were excavated without screening to a depth of 30 cm. Fill is described as soft soil with grass. Features 52 through 54, also unscreened, were excavated to depths of 45 and 50 cm. The

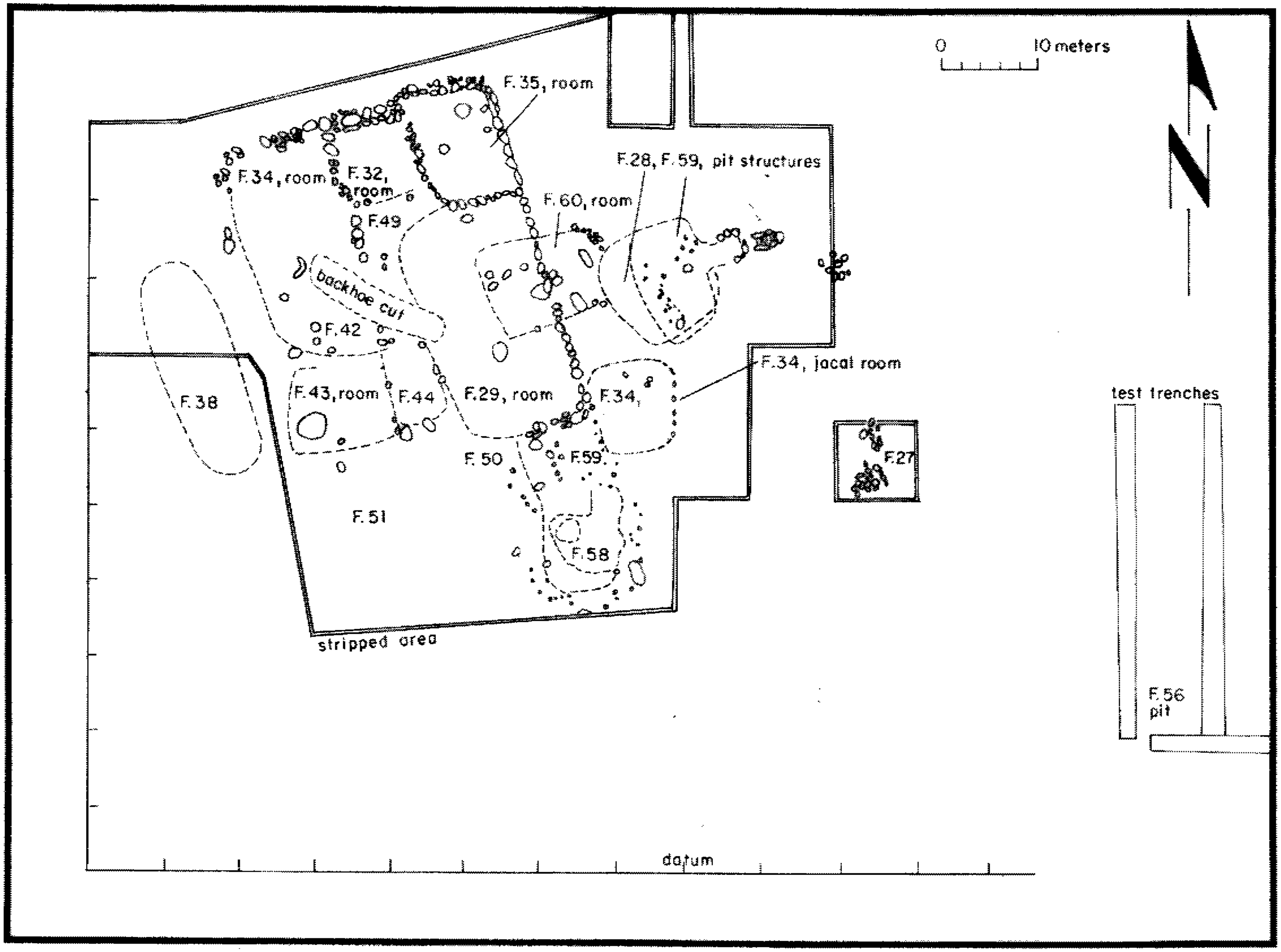

Figure 35. LA 6076 site map.

fill was described as forest loam with roots in the upper 10 cm and rocks throughout, overlying pink-white tufa.

Excavation was generally in 15 cm levels. Little screening was done, mostly for floor fill and floor features.

Feature Descriptions

LA 6076 consists of at least two distinct sets of rooms. Features 42, 59, and 60 are overlain by other rooms, suggesting a break in occupation. Some or all of the jacal rooms may go with the earlier occupation.

Pit Structures

Feature 28. The later of the two pit structures, Feature 28 is located north of and at the base of the slope into which the rooms were excavated (Fig. 36). Fill was undifferentiated sandy clayey soil with a small amount of rock and a fair amount of cultural material. The upper fill was rapidly removed with picks and shovels and was not screened. Burned roof plaster with impressions of small-diameter poles (1 to 2 cm) and charcoal were present 10 to 40 cm above the floor, indicating that the structure had burned. A dendrochronological sample from the burned roofing dated 1044fp-1101vv (HWS-77).

At 50 cm below the surface was a large pit, Feature 37, measuring 120 cm in diameter and 50 cm deep. Fill was trash and included three partial vessels and decomposed bones, suggesting a burial pit. The pit was circular, unplastered, and in poor condition.

The pit structure was rectangular with rounded corners and had a floor area of approximately 8.8 sq m (Table 51). Walls were earth covered with a thin layer of plaster. The maximum remaining wall height was 1.14 m. The floor, at 1.9 m below ground surface and 0.9 to 1.1 m below the prehistoric ground surface, was in fair condition. The presence or absence of plaster was not noted. Floor contact sherds included Reserve Black-on-white, Reserve Indented Corrugated, and Reserve Plain Corrugated.

Features include a hearth, a rock-lined pit, a posthole, a cist, and a ventilator in the center of the northwest wall. The hearth was centrally located, circular, and slab-lined, measuring 45 to 50 cm in diameter and 23 cm deep. No observations were made on the fill. Along and at the center of the southeast wall was a small rock-lined pit measuring 31 cm in diameter and 23 cm deep. No information on the fill or condition of the rock is given, except that they were covered with a greasy black film and that the pit might be a heating pit or a posthole (Fig. 37). In the east corner a pit measuring 29 cm in diameter and 19 cm deep was tentatively called a posthole. The cist was 43 cm in diameter at floor level and 53 cm deep.

The ventilator opening measured 30 cm wide at the top, 18 cm at the bottom, and 40 cm high. The vertical portion was stone-lined from the structure walls back at least 1.24 m and plastered from at least 0.5 m below ground surface. The top of the vent tunnel was lined with poles 60 to 70 cm above the floor.

Feature 59. A subfloor test in Feature 28 revealed the presence of a lower structure. The floor of the earlier pit structure was approximately 40 cm below that of Feature 28 and slightly offset

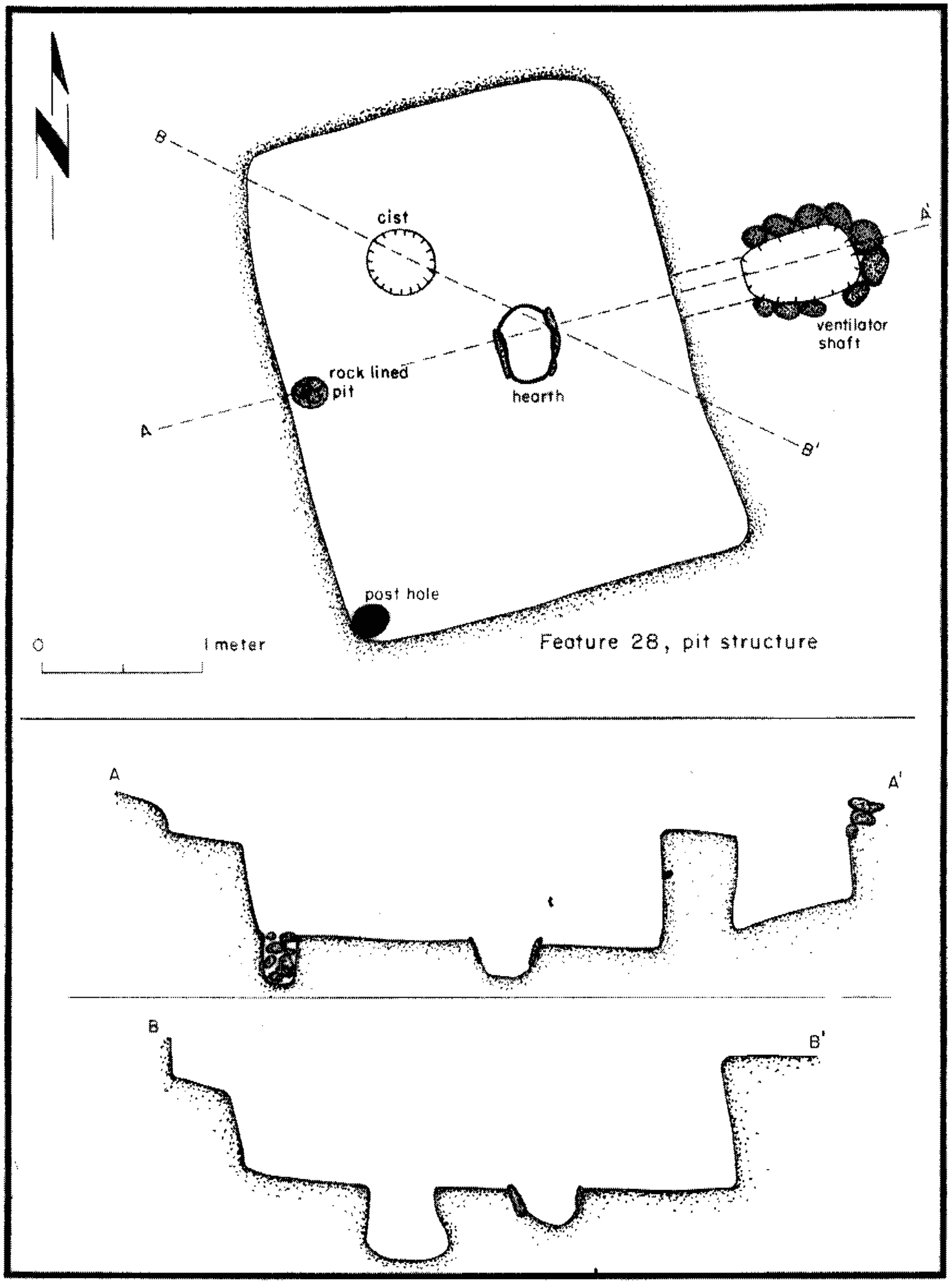

Figure 36. Feature 28, LA 6076.

(Fig. 38). The upper fill was a layer of sterile sand up to 33 cm thick that formed a base for the floor of Feature 28. The lower fill contained abundant charcoal, chunks of plaster, burned grass stalks, and a few rocks in a dark brown soil. The floor and the east wall plaster were scorched from the burning of the roof.

Figure 37. Rock-filled pit in Feature 28, LA 6076.

The structure was roughly rectangular, with a floor area of 6.4 sq m (Table 51). On the northwest side was a small antechamber or vent niche measuring 0.7 m on a side. The structure was excavated into trash and sterile soil, and wall heights ranged from 0.4 m to 1.45 m along the northern wall. Walls were plastered, and all but a small portion on the east wall had fallen off. The floor, 2.3 m below modern ground surface, was plastered clay over sterile sand and was in good condition on the west side. Floor contact sherds included several of the Reserve series, and over 40 percent of the pit structure assemblage was indented white ware.

Among the floor features were a hearth, an ashpit, a pot rest, a ventilator, a possible deflector screen, 4 bell-shaped pits, 11 postholes, and 2 eroded areas. The hearth was round with a clay rim. The outer diameter was 60 cm, the inner diameter 35 cm, and the hearth was 8 cm deep. The ashpit was adjacent to the hearth and measured 30 cm in diameter by 2 cm deep. The pot rest, near the west wall, was 22 cm in diameter and 2 cm deep.

An eroded area near the vent, in conjunction with Posthole 8, may represent the remains of a deflector screen. Two trough metates sat near the hearth and ashpit. The measurements of the bell-shaped pits are found in Table 52. Pits 1 and 4 were filled with soft dark brown soil and much charcoal. Pits 2 and 3 had fill of loose ashy soil and rock.

The ventilator was located in the center of the north wall. It measured 73 cm wide, 40 cm high,

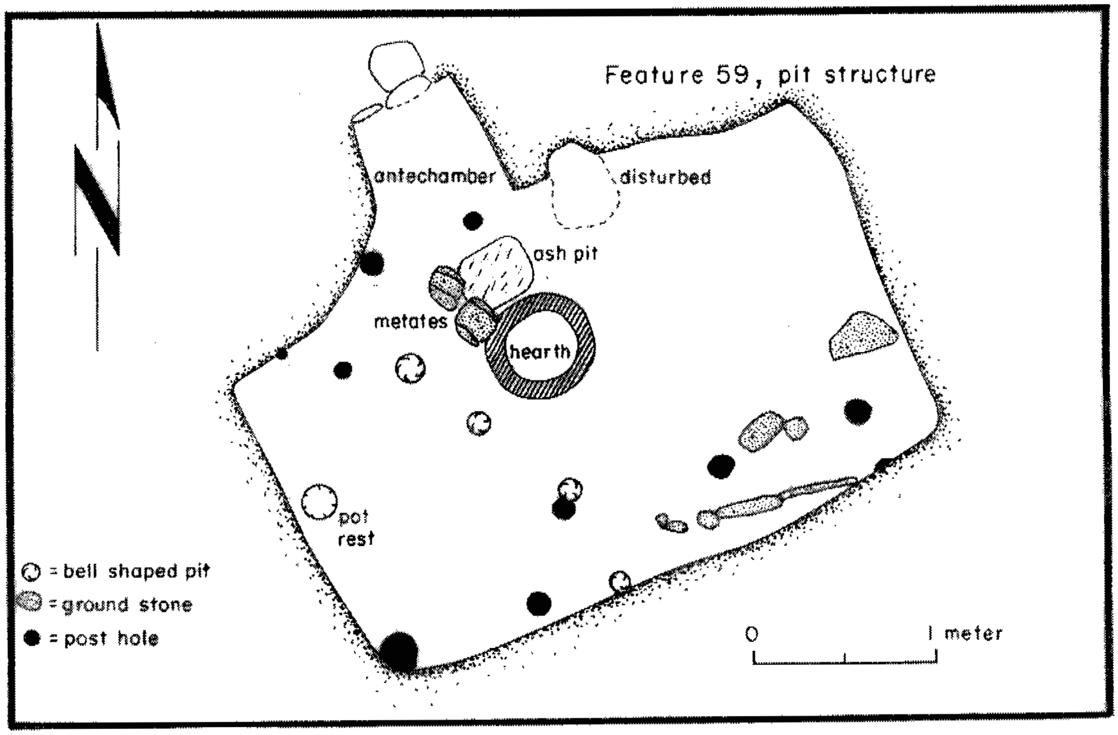

Figure 38. Feature 59, LA 6076.

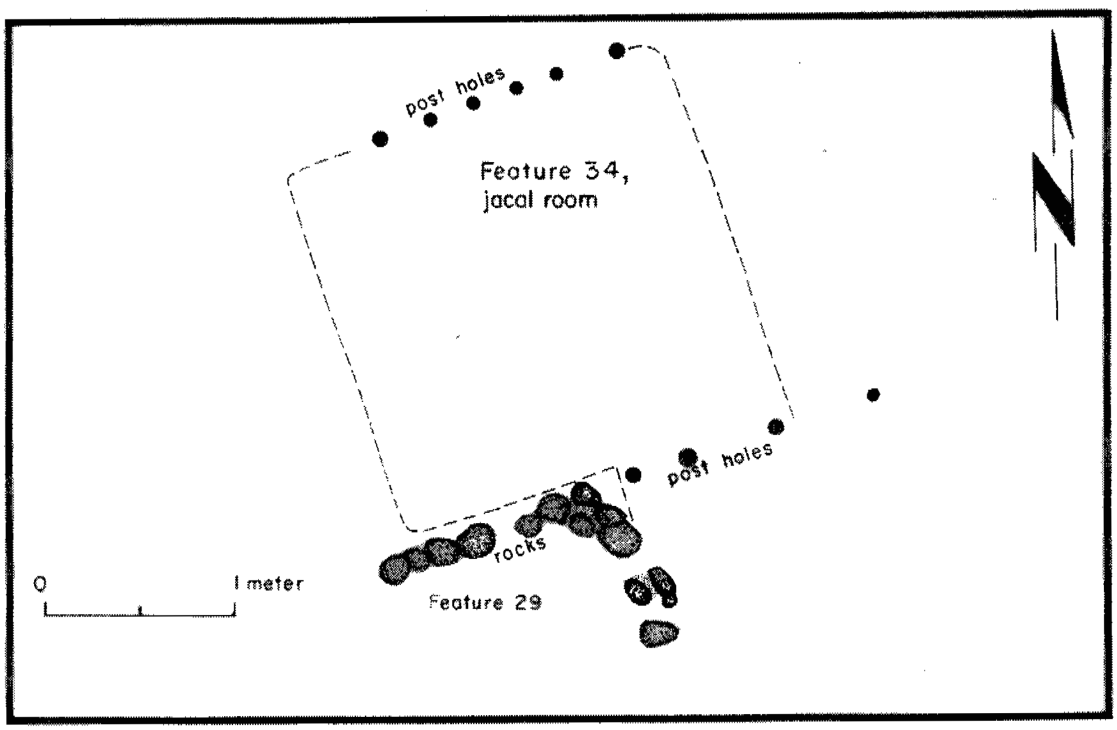

Figure 39. Feature 34, LA 6076.

and 72 cm deep.

Rooms

Feature 34. Almost adjacent to the southeast corner of Feature 28, Feature 34 was a small rectangular jacal room with a floor area of 4.8 sq m (Fig. 39). The floor, 0.7 m below the surface, was dug into sterile tufa and unplastered. The north wall was formed by six posts, and the south, which is partially covered by the masonry corner of Feature 29, had at least three postholes. The west wall was destroyed by the construction of Feature 28. No floor features were found; however, only the northern portion of the feature was fully excavated.

Fill was dark brown forest loam with large amount of charcoal. The location beneath Feature 29 suggests Feature 34 was associated with the earlier pit structure. Since the south portion of the room was not fully excavated, it is difficult to say how it related to Feature 29--for example, whether it utilized a portion of the masonry wall of that room or whether that room overlies an earlier jacal wall. Like Feature 59, Feature 34 had a number of indented white wares in its fill, also suggesting an association with the earlier pit structure.

Feature 35. This corner room (Fig. 40) was roughly rectangular with rounded corners and an area of 4.3 sq m. The fill was brown-stained soil with burned clay, charcoal, and about 20 percent rock. Burned clay, ash, charcoal, and pieces of wood from the roof were found near the floor. Only the floor fill was screened.

The walls (Fig. 41) were coursed masonry with bands of larger and smaller cobbles. The maximum height of the south wall was 1.17 m, and of the north wall 0.56 . There was no evidence of plaster.

The floor, at 1.09 m below the present ground surface, was the best-preserved of the room floors. The clay comprising the floor had packing and polishing marks. Floor features include two hearths and three postholes (Fig. 42). The westernmost hearth measured 43 cm in diameter and 22 cm deep. It was plastered over. The central hearth measured 38 cm in diameter by 8 cm deep. The posthole had diameters of 17, 20, and 24 cm.

Feature 29 (Fig. 43) was cut into the hillside and overlies a portion of Feature 60. The north wall and portions of the east and west walls consisted of stacked cobbles set in sandy clayey mortar (Fig. 44). The remaining walls were plastered native earth. A backhoe trench (Feature 39) cut through the central portion of the south wall. The maximum height of the south wall was 1.34 m, the west 1.15 m, the east 0.89 m, and the north 0.72 m. Patches of plaster about 5 cm thick were found on the south end of the west wall. A floor-level vent opening or very narrow doorway (Fig. 45) measured 38 cm wide and was 25 cm above the level of the floor.

The room was roughly rectangular, with an area of 17.4 sq m. Fill was dark loam with 10 percent rock and some charcoal. A dendrochronological sample from the east side of the room dated 990fp-1082vv (HWS-72). A radiocarbon sample from the floor and features was dated A.D. 990 $\pm$ 70 (Beta 28741), too early for this structure.

The floor, at 0.64 m below the modern ground surface, was native earth, irregular, and in poor condition. A slab-lined hearth measured 45 cm in diameter and 41 cm deep (Fig. 46). Scraping around the hearth revealed two long narrow slots 10 cm wide by 25 cm long, probably

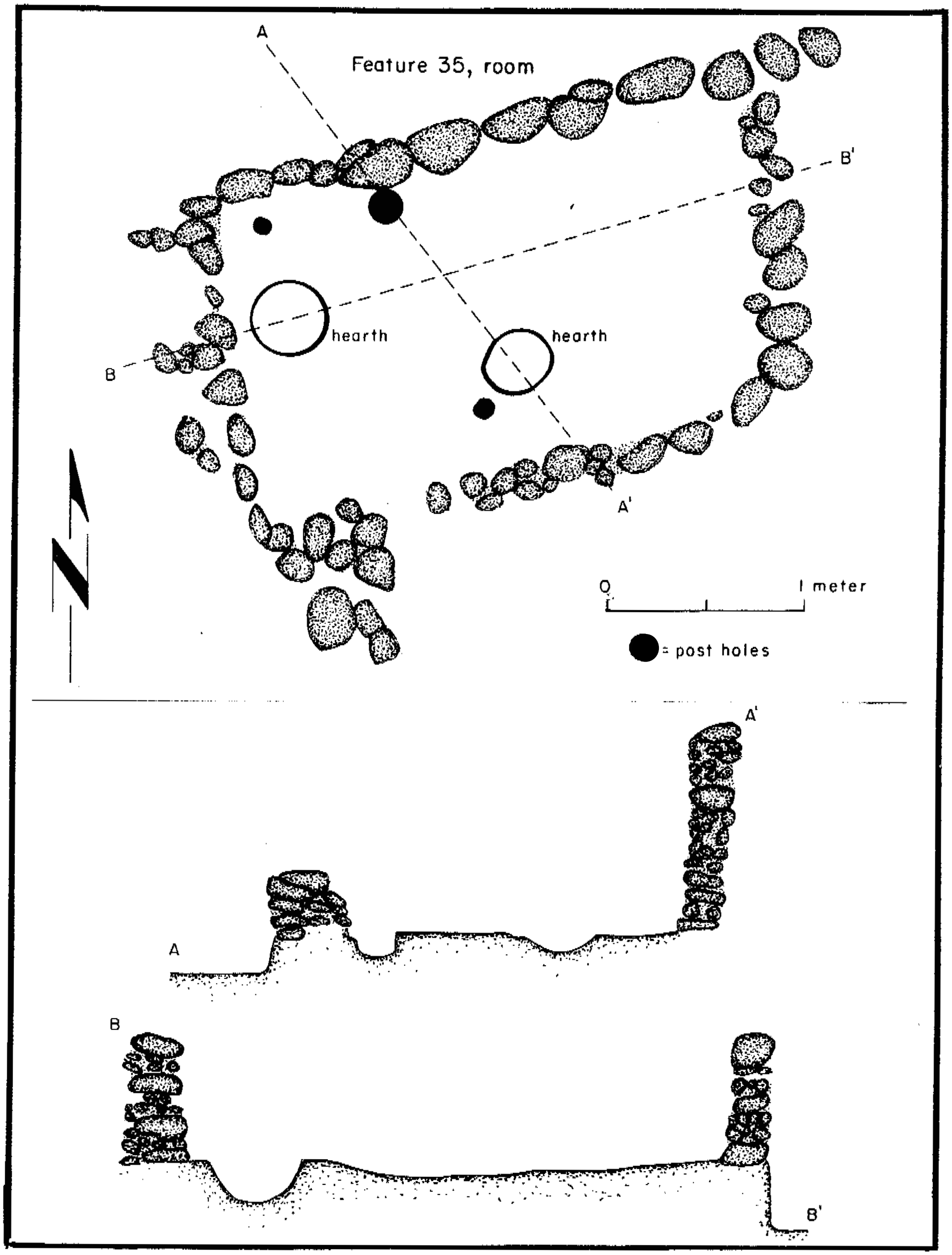

Figure 40. Feature 35, LA 6076.

Figure 41. Coursed masonry, Feature 35, LA 6076.

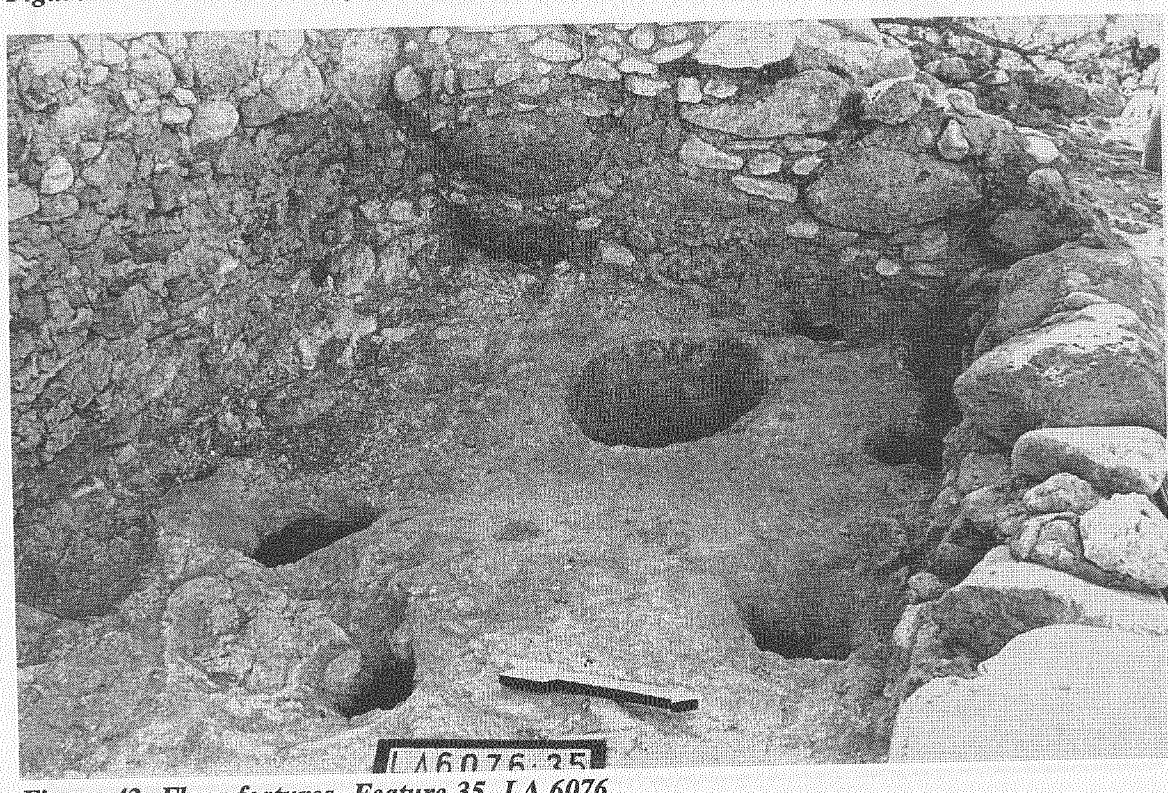

Figure 42. Floor features, Feature 35, LA 6076.

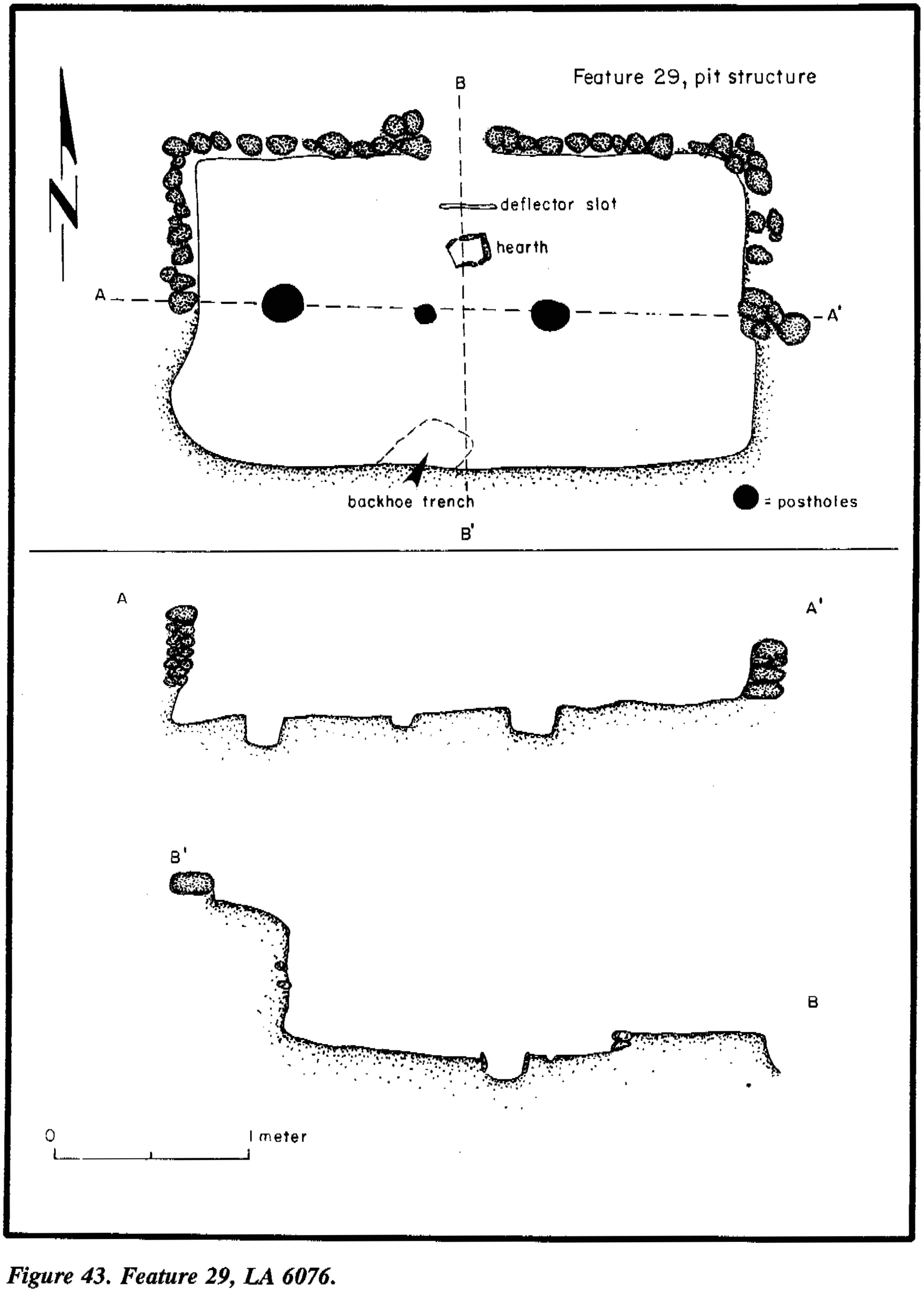

Figure 43. Feature 29, LA 6076.

Figure 44. Wall construction, Feature 29, LA 6076.

Figure 45. Floor-level vent or doorway, Feature 29, LA 6076.

for deflector slabs. Between the slots and the hearth was an irregular depression that may have been an ash pit, although no ash was present. Three postholes were roughly aligned at the center of the room. Diameters of 38 and 55 cm were recorded for two of these.

Figure 46. Hearth, Feature 29, LA 6076.

Feature 60. Subfloor testing in Feature 29 located Feature 60, half of which underlies that room (Fig. 47). Feature 60 had been thoroughly burned and was filled with burned roof fall. Two dendrochronological samples dated to 1077r and 1085r (HWS 67 and 68). A radiocarbon sample from the roof fall layer is slightly later than the dendrochronological dates, A.D. 1130 $\pm$ 50 (Beta 28742). Roofing impressions indicate the roof was constructed of 4 to 8 cm strips of split juniper and small 2 to 3 cm diameter poles covered by 2 to 4 cm of clay. After burning, the room was reoccupied and a hearth built above the roof-fall layer.

Walls were of plastered earth with masonry in the west corner. The maximum wall height was 0.3 m, and the floor area was 8.0 sq m. Floor features include a stone deflector, a small clay rimmed hearth with a lower and smaller hearth offset from the first, a shallow ash-filled pit, and a large central post burned off at floor level. The map also indicates two additional shallow pits with ash, another posthole, and a masonry feature measuring 10 by 50 cm.

Feature 41 (Features 57 and 58). The area just east of Feature 29 was originally thought to represent one large room and was labeled Feature 41 (Fig. 48). However, the crew soon noticed that the floor was at two levels, one 55 cm deeper than the other. The west half was then designated Feature 57 and the east Feature 58. Fill and floor artifacts were not separated until they were certain it was two rooms. Because the floor of Feature 57 was so much higher than that of Feature 58, it is likely that the materials collected as floor fill of Feature 41 are predominately from Feature 57. The west fill was described as ash- and charcoal-filled loam with rocks and trash. The east fill had plaster chunks, much charcoal, and trash in a brown loam with few rocks.

The south wall of Feature 57 was cut into the hillside and had three posts upslope at ground level. The north and east walls are marked by nine postholes, and the west was formed by the eastern masonry wall of Feature 29. The south wall height was 0.62 m, and the west wall was 0.8 m high. The floor area was 2.7 sq m. Neither the walls nor the floor were prepared. Features include a bell-shaped pit in the southwest corner measuring 30 cm at the top, 47 cm at the bottom, and 39 cm deep, and a bowl rest 36 cm in diameter and 15 cm deep. The Feature 57 floor was at the same level as that of Feature 29, and it utilized a wall of that room, indicating the two rooms were contemporaneous.

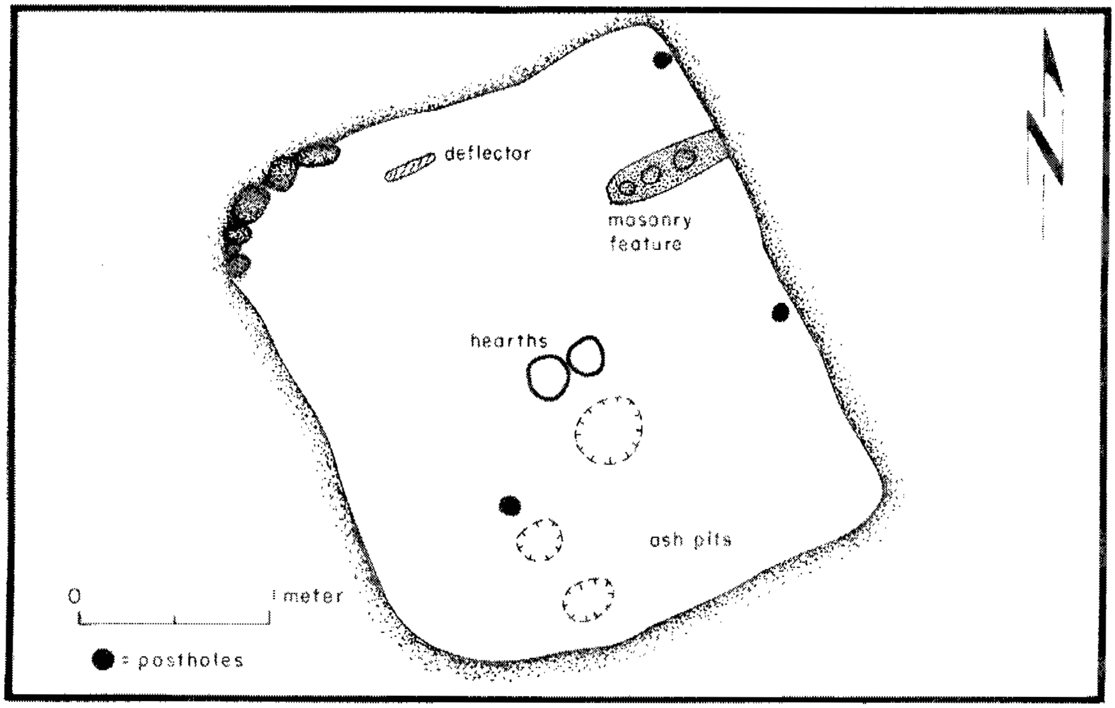

Figure 47. Feature 60, LA 6076.

Feature 58 was excavated 0.55 m below the level of the Feature 57 floor and had pole walls at the prehistoric ground level. A possible feature or root channel cut a niche in the east wall 25 cm wide by 45 cm deep into the tufa. The floor was a mixture of plaster and tufa spread over sand and was mostly eroded away. It was 1.0 m below modern ground level, and it had a 0.5 m high bench in the southeast corner. The area was 4.3 sq m.

Eight postholes, mainly on the west side and possibly shared with Feature 57, and one bell-shaped pit comprise the Feature 58 features. The pit was 0.74 m in diameter at the top, 0.9 m at the bottom, and 1.5 m deep. It was trash filled and contained much burned and unburned wood.

Two dendrochronological samples from the fill of Feature 57 dated 762 - 897vv (HWS 73) and

1034fp - 1089vv (HWS 74). A sample from a posthole in Feature 58 dated 1030p-1090vv (HWS 78). A radiocarbon sample from the floor fill of Feature 41 dated A.D. 1250 ± 50 (Beta 28740).

Feature 32 (Fig. 49) was the easternmost of the second tier of masonry rooms (Fig. 50). Walls were masonry on at least three sides and possibly the fourth. The room had only 15 cm of fill, and the floor was eroded away. No features were observed. The floor area was 3.7 sq m, and the corner wall heights were 0.21 m in the southeast, 0.8 m in the northwest, and 1.84 m in the southwest. The northeastern corner was gone.

Feature 49. The space between Features 29 and 32, called Feature 49, may represent a walkway or small storage room with an area of 3.9 sq m. The backhoe trench entirely removed what could have been an eastern wall. Alternatively, Feature 49 may have joined with Feature 44 to form a long walkway between Features 29 and 31, although a difference in floor depths suggests this was not the case. The floor of Feature 44 was 45 cm below the modern ground surface, and that of Feature 49 was 23 cm below the modern ground surface.

Walls were masonry over dugout portions. Fill was forest loam with rock. The floor was eroded away, no features were observed, and no cultural material was recovered.

Feature 44, which did not have an east or west wall, may have been a walkway. The fill was the same as in Feature 49, forest loam with rock. Again, no cultural material or features were found. The area is estimated at 2.0 sq m, and the floor was completely eroded away.

Features 50 and 51. Just south of Features 57 and 58 are a number of postholes that may represent the remains of jacal rooms. Feature 50 had a plastered floor 25 cm below ground surface and an area of 9.4 sq m. Posts formed the north and south walls and masonry the west. There was no evidence of an east wall.

Feature 51 was described as rectangular, comprised of posts set in earth, and with a floor area of 10.5 sq m. The floor, 20 cm below surface, was eroded away.

Three of the postholes attributed to these features are also attributed to the south wall of Feature 57, and the remaining four postholes are not on the site map. A single floor-contact sherd from Feature 50 and two from Feature 51 are all that are assigned to these rooms. Neither room is on the site map, and the feature map is unclear on how these rooms relate to each other or other rooms in the block. It is difficult to say they represent rooms at all and may have been no more than use-surfaces.

Feature 31. The westernmost room of the third tier of masonry rooms is Feature 31 (Fig. 51). The north wall was affected by backhoe work. Assuming there were two rooms in this tier, the excavators called the eastern portion Feature 36 until no wall was located. The fill of Feature 31 was forest loam overlying a sterile earth floor with no evidence of plaster. Some ash was observed in the southeast corner.

The north and east walls were of coursed masonry. The south and east were excavated into the slope, with masonry rimming the excavated portion. The floor area was 12.7 sq m, and the maximum wall heights were 18 cm for the north, 73 cm for the south, 38 cm for the east, and 43 cm for the west wall.

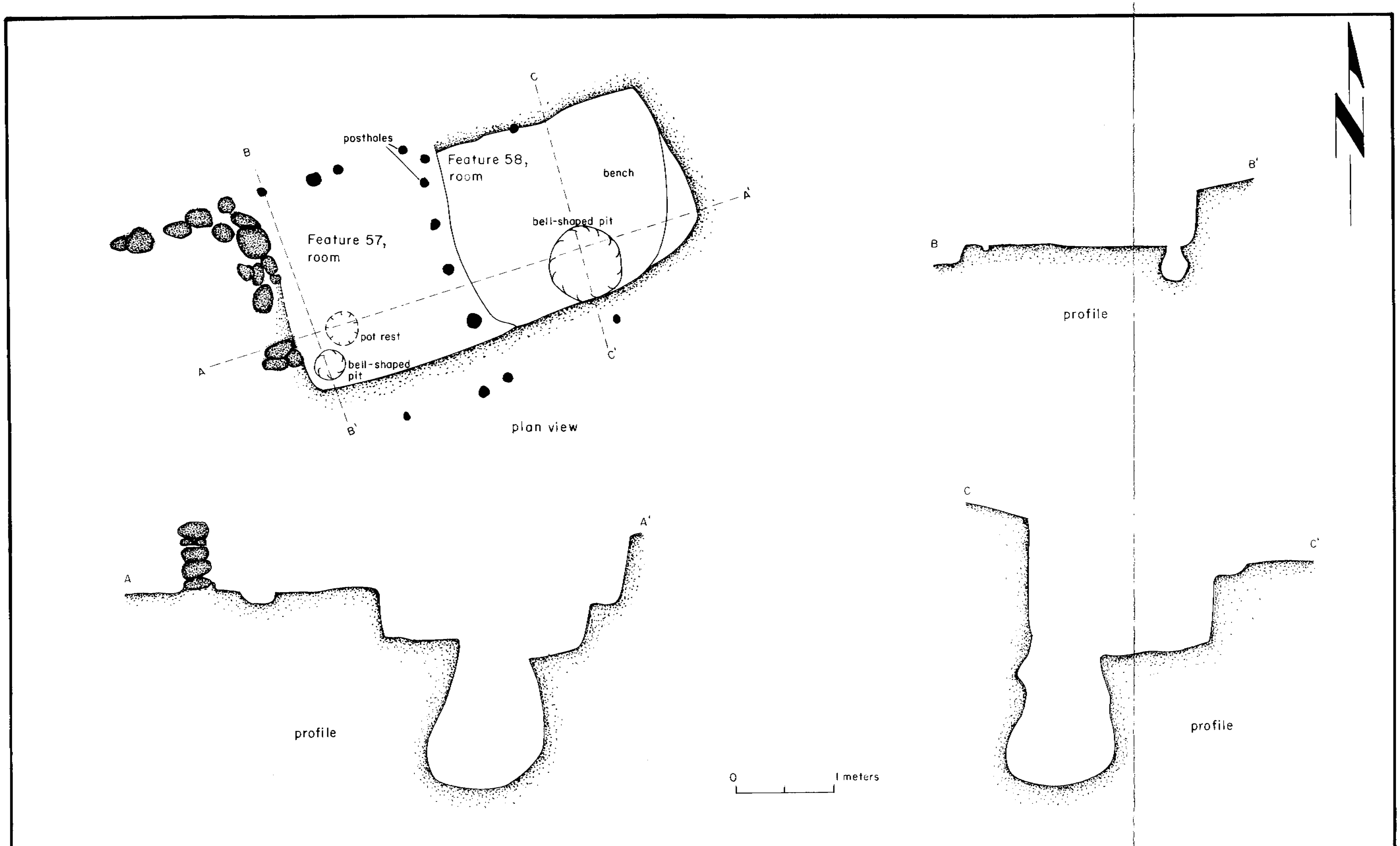

Figure 48. Feature 41 (Features 57 and 58), LA 6076.

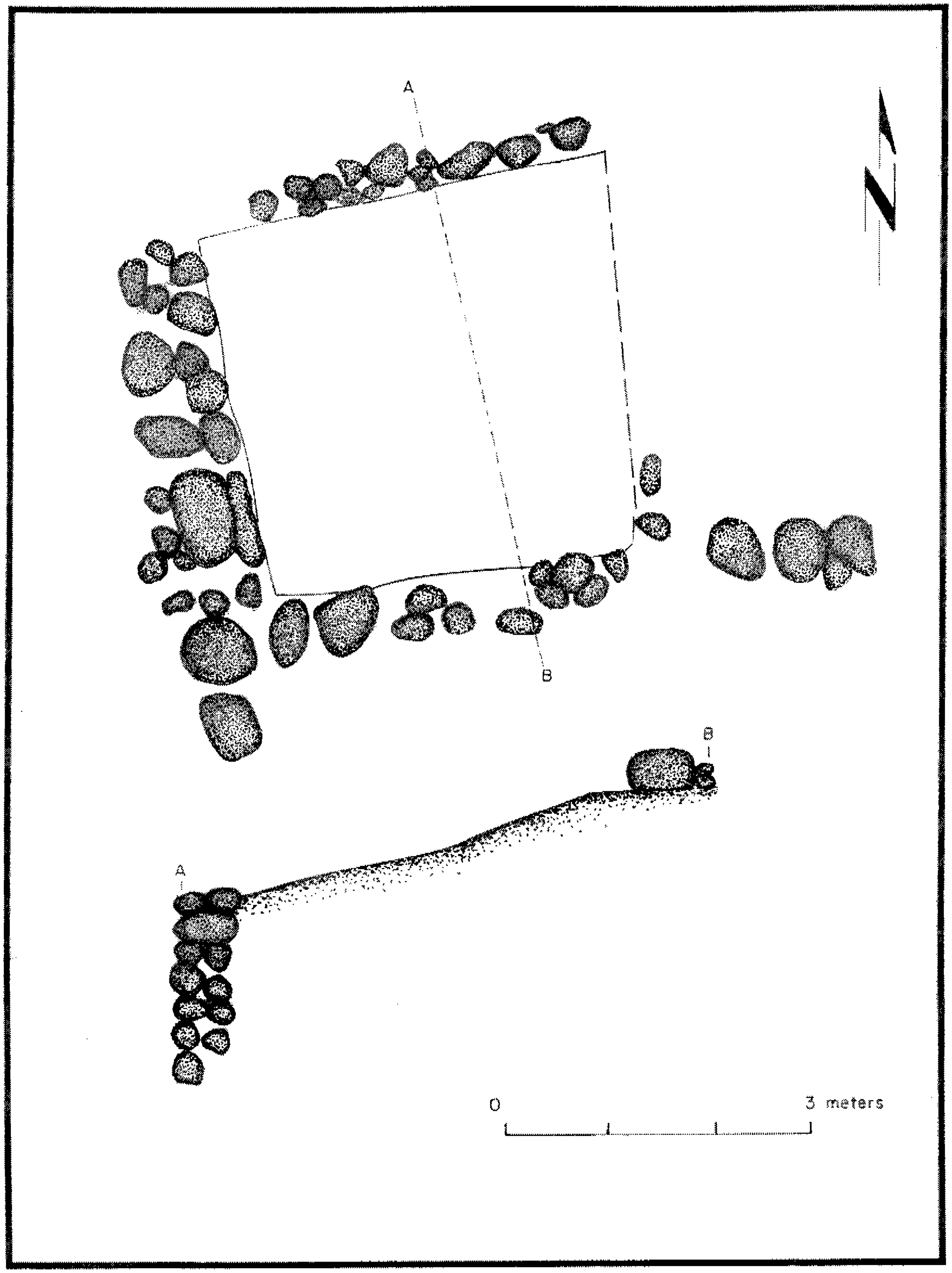

Figure 49. Feature 32, LA 6076.

Figure 50. LA 6076, looking southwest.

Floor features include a slab-lined hearth 38 cm in diameter and 10 cm deep and several postholes. Sweeping a dark-stained area within the room revealed a possible earlier jacal structure (Feature 42). The area was 5.2 sq m in diameter and consisted of a slightly scooped-out floor at the same level as that of Feature 31 and with poles set around the perimeter. The remaining floor was plastered with sterile tufa, and the floors of Feature 29 and 32 were excavated through it. Feature 42 was not mapped, and except for the perimeter postholes, no features were found. Any features present may have been destroyed by the backhoe trench or later rooms.

Feature 43. All that remained of this room was a rectangular 6.2 sq m floor cut into sterile ground (Fig. 52). Fill was forest litter, loam, grass roots, and rock. Wall heights were 20 cm on the south and west, there was no wall to the north, and the height ranged up to 25 cm for the east wall. The floor surface was 55 cm below modern ground surface and consisted of plaster over sterile tufa. Floor features include an 18 cm diameter posthole in the southeast corner and a bell-shaped pit. The pit measured 75 cm in diameter and 93 cm deep. Fill was rock and ceramics.

Other Features

Feature 27. Located in Grid 11I, this circular area of rock measured 1.29 by 1.52 m in diameter and was encountered 16 cm below the modern ground surface. The depth of the concentration was not recorded; however, excavation continued for at least 60 cm. A bed of ashes was noted at 30 cm, and an inverted Alma Plain bowl was found between 30 and 45 cm. Fill included charcoal, sherds, bones, and lithic artifacts.

Feature 38. Upslope from the roomblock in Features 20 and 21 was an ovoid basin interpreted as an area where rock was removed and filled with soil to make a small garden. It measured 6.0 m

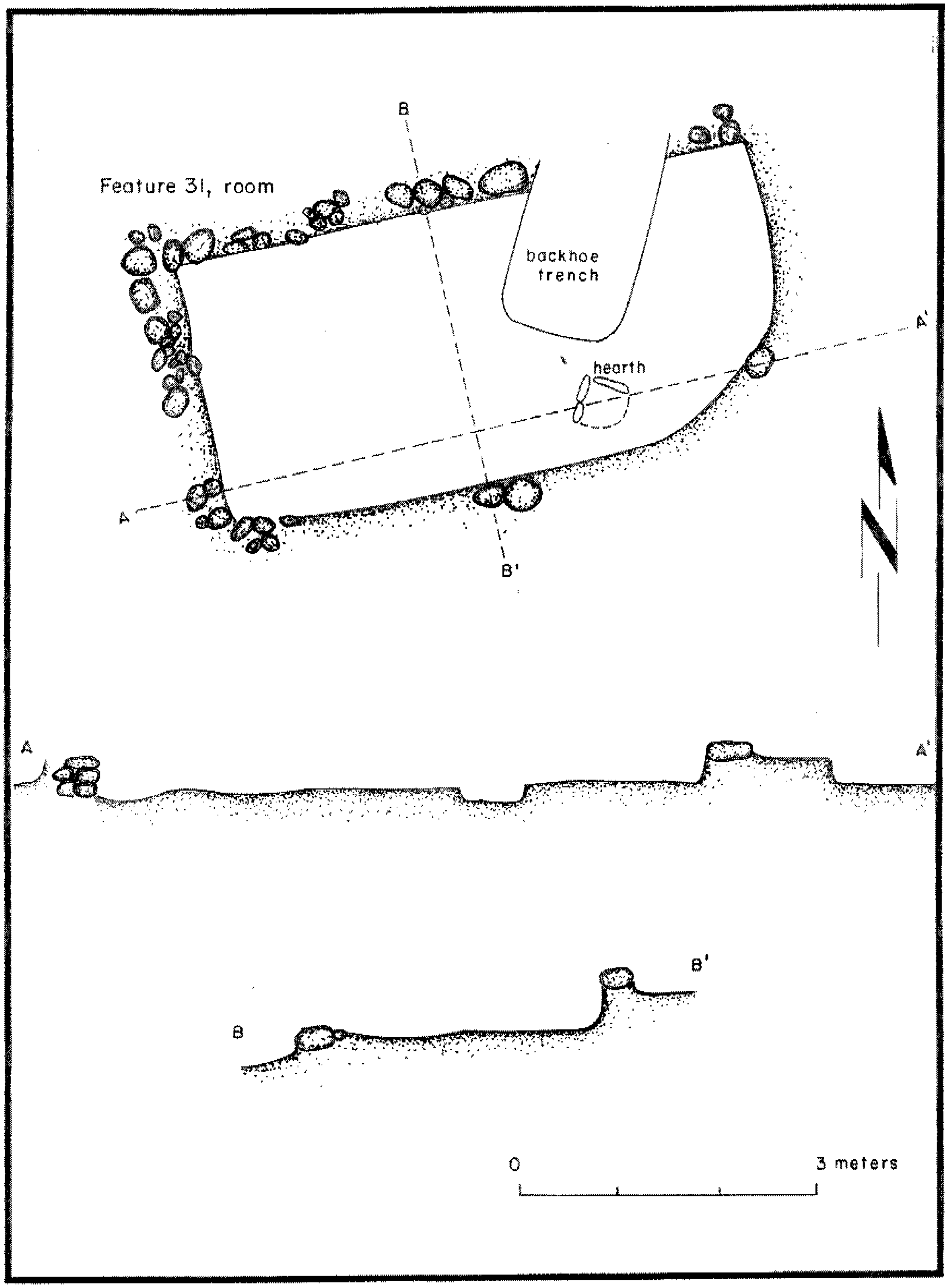

Figure 51. Feature 31, LA 6076.

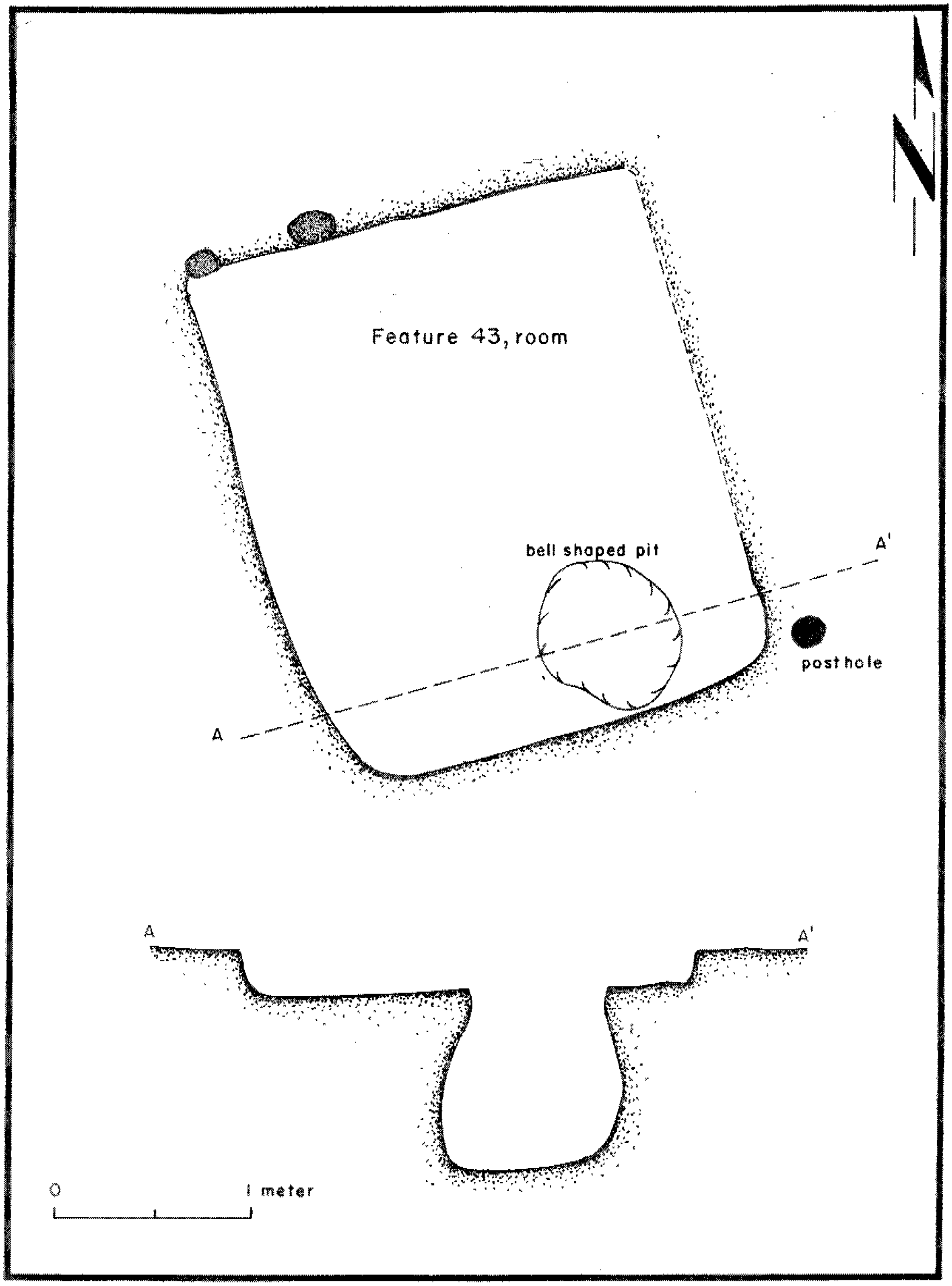

Figure 52. Feature 43, LA 6076.

east to west and 2.0 m north to south. The fill was 20 to 30 cm of forest loam with a few rocks.

Feature 55. Located several meters north of Feature 59, this circular roasting pit was 95 cm in diameter and 20 cm deep. It was rock lined and rock filled, with much charcoal in the fill.

Feature 56 was a bell-shaped pit north and east of the roomblock. It measured 60 cm at the mouth and 87 cm at the bottom. It had a depth of 84 cm. Sixty-five centimeters of the pit was dug into tufa. Fill was brown forest loam with a few rocks.

Feature 61

Feature 61, a pile of rock south of the roomblock, was bisected and half the rock removed. No cultural material was observed, and the rock was in no particular order. The area, 70 cm in diameter, may have been a natural outcrop of rock.

Feature 62

Also south of the rooms was a possible shrine consisting of two stacked rocks on the highest point of the ridge. Removal of the top rock revealed a rectangular Wingate Black-on-red sherd measuring 4.1 by 3.9 cm and ground on one corner.

Cultural Material

Ceramic Wares

LA 6076 produced the second largest assemblage of sherds (3,677) and nine partially restorable vessels. After brown ware body sherds, Reserve Plain Corrugated is the most numerous type. The Reserve series comprises almost half of the total (42.9 percent), with only 6.7 percent from the Tularosa series and 5.9 percent indented white ware. The following descriptions of wares and vessels are based on Talley n.d. and Plettenberg n.d.

The sherds typed Alma Textured have surfaces that are exuberantly pinched, punched, and scored. Sherds called Alma Neck Banded may actually be Tularosa Patterned Corrugated, but have wider, flatter corrugations. The last row of coils on Three Circle Neck Banded sherds are indented and could also be a variant of Tularosa Corrugated.

Reserve Punched Corrugated was found in a bowl form. Interiors are well smudged and polished. Four black-on-white sherds have a glaze mineral paint with attributes otherwise typical of Reserve Black-on-white. Indented bases, which are not common in the Reserve area (Barter 1957:107-108), occur at LA 6076. A bowl base typed as Reserve Plain Corrugated, Smudged, has such a base.

A complete bowl, probably Alma Plain, was the only complete vessel found. It is small, 10 cm in diameter, and 3.5 cm deep, with 0.7 cm thick walls (Fig. 53). The interior coils are smoothed and the exterior left unmodified. The size and crudeness suggest a first effort or an experiment with clay resources.

Sherds from Features 28 and 37 were used to reconstruct the lower half of a Reserve Plain

Corrugated jar (Fig. 54, bottom) with a maximum diameter of 26 cm and 0.6 cm thick walls. The interior is well smoothed. The exterior is evenly corrugated, with six coils every 2 cm. Two Reserve Plain Corrugated Neck Banded jars were partially reconstructed. The first, representing a jar with a mouth diameter of 16 cm, is only 12 percent complete. The interior is not polished, and it is heavily sooted. The zone of corrugated is 6.9 cm wide, and it has six corrugations per 2 cm. The rim is everted at a 90 degree angle, and the plain rim is 2.7 cm wide. The second jar is a third complete and has a floated interior surface (Fig. 54, top). The corrugated portion is 7.3 cm wide, with seven coils in 2 cm. The plain rim is 2.2 cm wide and everted at a 90 degree angle.

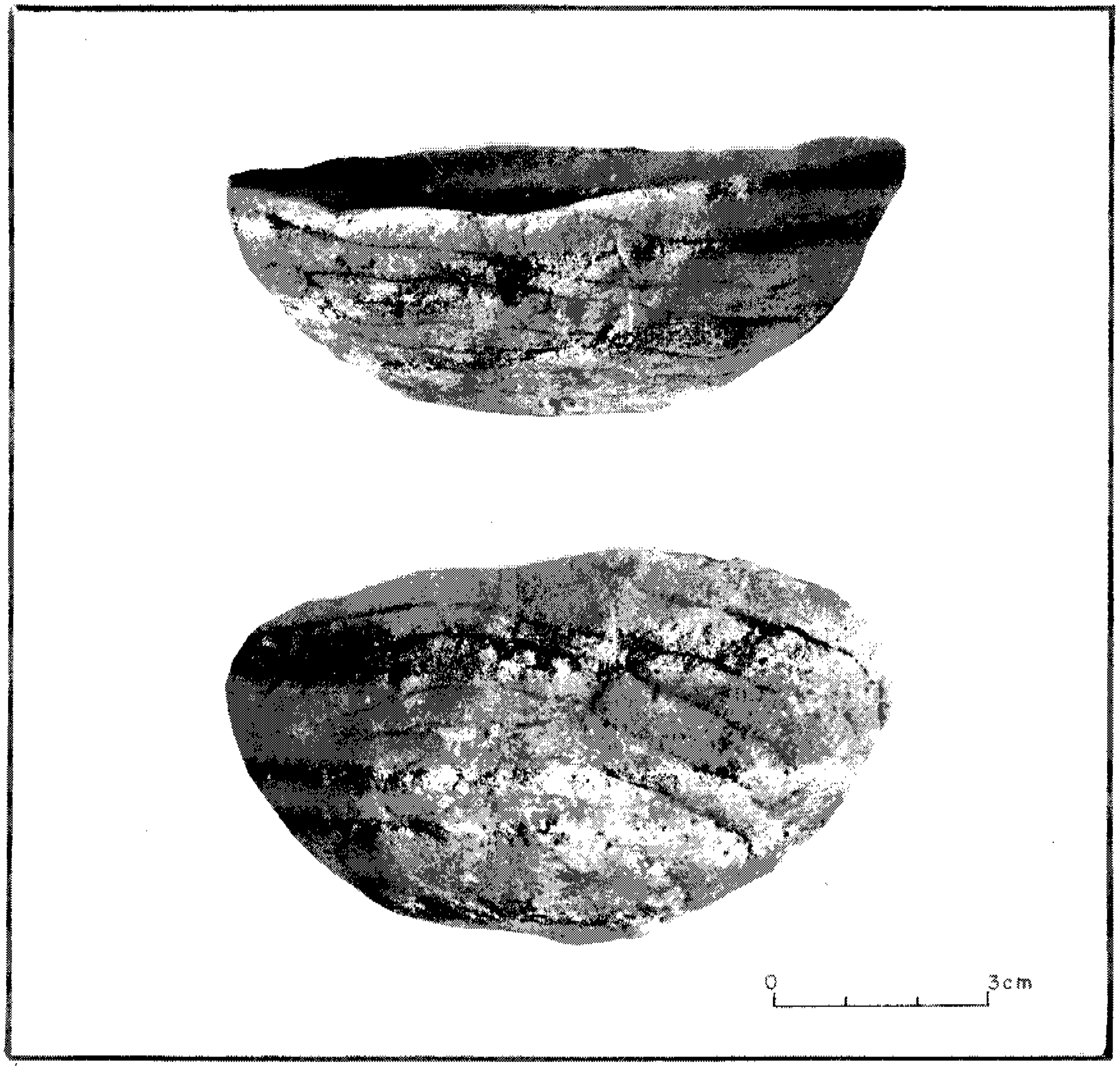

Figure 53. Ceramic vessel, LA 6076: Alma Plain (FS 27-4).

A third reconstructed Reserve Indented Corrugated jar (Fig. 55, bottom right) is roughly 25 cm in diameter, 16 cm deep, and 0.6 cm thick. The interior is unpolished, and smoothing marks are evident. The exterior is either smudged or sooted in various areas. Indented coils, five in 2 cm, covers the body up to the 1 cm wide rim. The rim is everted at a 95 degree angle.

Figure 54. Ceramic vessels, LA 6076: Reserve Plain Corrugated, neck-banded (FS 43-10); Reserve Corrugated (FS 37-9).

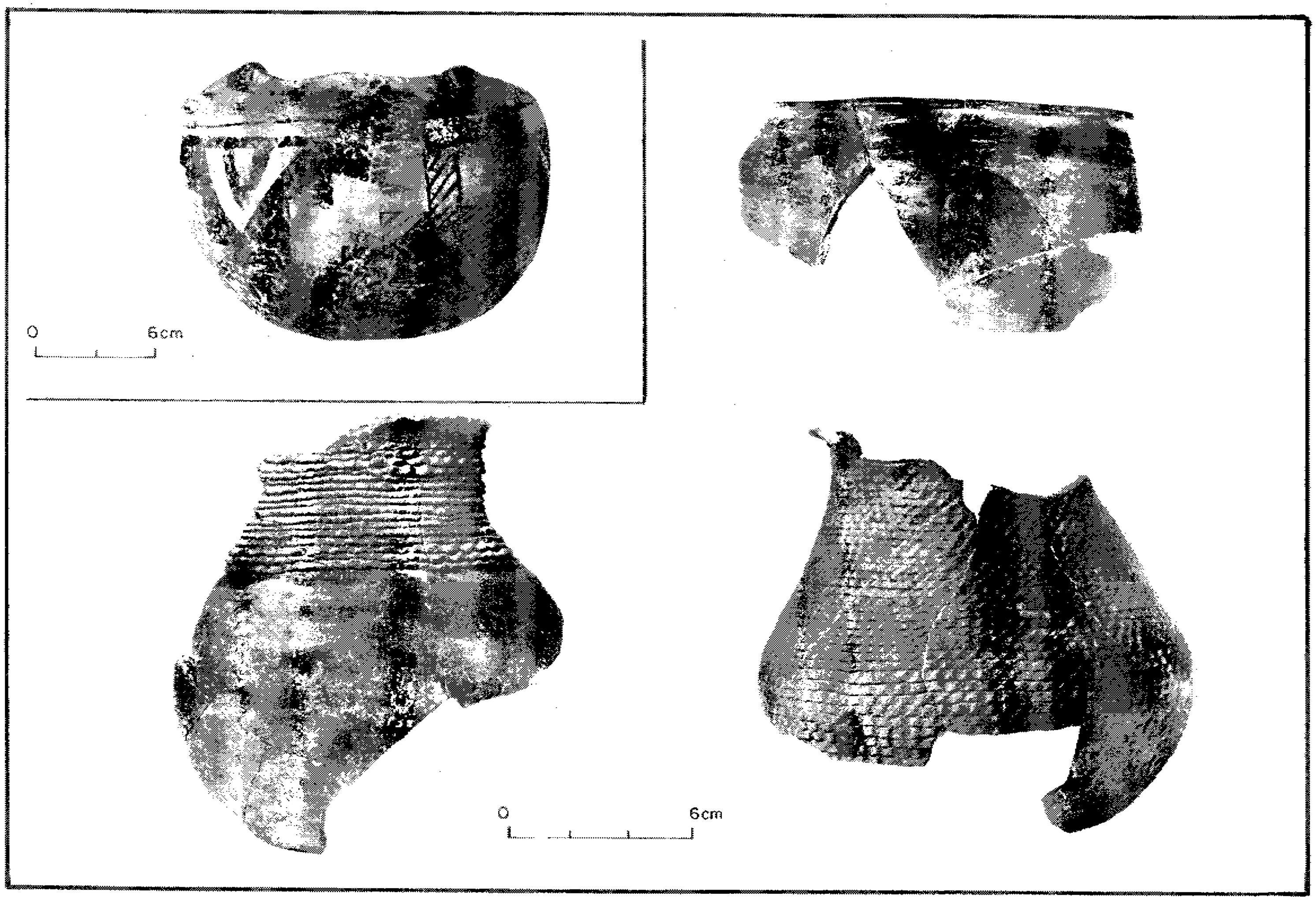

Figure 55. Ceramic vessels, LA 6076: top left, Reserve Black-on-white (FS 37-1); top right, Reserve Smudged (28-31-54); bottom left, Tularosa Patterned Corrugated (FS 28-23); bottom right, Reserve Indented Corrugated (FS 28-51 and 100).

Two partial Reserve Smudged bowls were recovered (Fig. 55, top right). The first is a quarter complete with a mouth diameter of 28 cm, a depth of at least 19.8 cm, and walls 0.6 thick. The interior surface is highly polished and smudged, with scraping marks evident on the interior and exterior surfaces. The rim is simple, direct, and slightly thinner at the lip. The second bowl is also a quarter complete. It is 28 cm in diameter at the mouth and 11 cm deep. It has 0.6 cm thick walls. The exterior is smudged, and polishing marks are evident. The rim is everted outward at 95 degrees.

The only painted vessel that could be reconstructed is the lower body of a Reserve Black-on-white jar (Fig. 55, top left). It measures 10 cm wide and 8 cm deep with a broken lung or handle attached at the shoulder. The interior is uneven with smoothing marks, the exterior is slipped and uneven, and the design is in a band with upper and lower framing lines.

The final partial vessel is about a quarter of a Tularosa Patterned Corrugated Neck Banded jar (Fig. 55, bottom left). The mouth diameter is 32 cm, and the walls are 0.6 cm thick. Corrugations alternate between indented and plain, with each zone from 2.5 to 3.0 cm wide, eight plain coils or six indented coils in a band. Five bands continue onto the shoulder. The rim is plain, measuring 2.1 cm and everted at about 60 degrees.

Distribution. The bulk of the ceramics indicates an occupation in the A.D. 1100s, possibly extending into the A.D. 1200s. If the Alma Neck Banded and Three Circle Neck Banded are indeed variations on Tularosa Patterned Corrugated, then there is no evidence of an earlier occupation. The single Red Mesa Black-on-white sherd was a surface find.

The superimposition of structures indicates multiple occupations and possibly an occupation of some length. Examining the distribution of Reserve series, Tularosa series, and indented white wares for the earlier and later rooms indicates a decrease in white wares (Table 53). While it is difficult to draw conclusions from the decrease, it is a pattern repeated at two other sites and may suggest a realignment of ceramic exchange systems.

Tables 54 to 60 give the spatial distribution for the ceramics recovered. A summary is found in Table 61. The largest number was from surface stripping, but fair samples were found in the rooms. Unfortunately, the jacal and possible early rooms (Features 50 and 51) had virtually no sherds, and Features 41/57 and 58 were excavated in a manner that makes it impossible to date them with ceramics.

The latest-dating ware, St. Johns Black-on-red, was found during surface stripping and in a test square excavated from the surface to 45 cm deep. Likewise, Tularosa Black-on-white was most common in surface proveniences but occurred on or near the floors of Features 28, 31, 41, and 60. Location of the site on a fairly steep slope undoubtedly resulted in washing and mixing of sherds in the upper levels of fill.

Worked Sherds, by Rosemary Talley. Excavations at LA 6076 produced 37 worked sherds. These vary in manufacture and indicate a number of uses. The sherds were typed and divided into categories based on attributes of shape and wear patterns.

Drill holes. Five sherds, body or rim, were drilled from the interior, exterior, or a combination of surfaces. The holes were probably drilled to accommodate sinew or string with which the vessels could be "mended" and reused. One sherd shows grinding on one edge.

Disks. Another five sherds are whole disks, and four are disk fragments. Seven show grinding on all edges, and two were formed by chipping and show no wear. Four of the disks are corrugated and show corrugations running horizontally on the exterior surface, which may imply an aesthetic choice in their manufacture. Culin (1907:799-801) reports a board game played by the historic Zunis in which plain disks were used by one side in the game and perforated ones by the other.

Incised or scored. One sherd shows scoring on the exterior surface immediate and parallel to the break. Two black-on-white jar neck sherds show scoring 5 cm below the rim. Scoring probably circumscribed the jar neck.

Indeterminate shape, problematical function. This group shows, for the most part, slight wear other than preliminary shaping or grinding, and only on minor surfaces. All appear to be fragments of larger worked sherds.

Scraper. One Reserve Black-on-white sherd is ground on all edges to form a rectangle with rounded edges, slightly wider at the bottom (5.2 cm) than the top (4.2 cm). The whole sherd surface is nicely curved and fits the hand well. There is little doubt that it served a scraping purpose, because one edge is markedly beveled to the sherd exterior and shows grinding vertical to the beveled surface.

Palettes. One sherd has grinding on one edge and appears to be a fragment of a larger worked sherd. The interior surface is coated with a fugitive, clumped red material. Two Tularosa Black-on-white sherds fit together. They, in turn, are part of a larger worked sherd (a scoop?) showing one roughly ground irregular worked edge. The sherd interior shows a white chalky fugitive substance. Sherd shape, rim inclusive, indicates a seed jar fragment.

Preforms or blanks. Three sherds show no ground edges. Preliminary shaping occurs by chipping and/or flaking. One sherd is square, the other two are roughly ovoid. Another is a rim sherd from a brown ware bowl that is highly polished and shows an iridescent burnishing.

Since the absence as well as the presence of certain forms may be of interest, it should be noted that the excavation and analysis of LA 6076 produced no pendants, no spindle whorls, no notched sherds, and no "gaming pieces," which are rather commonly found in the Anasazi pueblos to the north.

Lithic Summary

LA 6076 has a comparatively large lithic assemblage consisting of 420 flakes, 57 angular debris, 101 tools, 37 cores, and nine hammerstones. A wide variety of tools was found, including shavers, knives, scrapers, drills, notched tools, and choppers. Rhyolite and chert/chalcedony were the most common material types (Wening, this volume).

Ground Stone, by Charles A. Hannaford

A total of 103 ground stone artifacts were recovered from LA 6076. The assemblage is composed primarily of grinding implements utilized mostly for maize processing, although the occasional presence of hematite adhering to ground surfaces suggests that pigments were also processed. The artifacts were manufactured principally from sandstone (n=46) and basalt (n=36), with smaller numbers of rhyolite (n=2), quartzite (n=6), chert (n=3), magnetite (n=1), mudstone (n=3), crystalline tuff (n=5), and limestone (n=1). Most of the artifacts were recovered from nonfeature proveniences or from the general fill of the pit structures or rooms (Table 62).

Manos. Three *one-hand manos* were recovered (Fig. 56, top left). These are relatively small, oval or discoidal manos that were probably used on a basin metate. The one complete mano has been ground on two opposing facets with battering wear on both ends. Measurements are 9.8 by 8.5 by 4.6 cm. The other two are fragmentary, one exhibiting one ground facet, the other three. Two manos were manufactured from basalt and one from sandstone. The one-hand manos were recovered from general site nonfeature proveniences.

In contrast to the small representation of one-hand manos, 24 *two-hand* manos were recovered. These manos are characterized by a rectangular outline and one or more grinding surfaces (Fig. 56, top right and two bottom photos). Only eight specimens are whole. The remaining 16 are end fragments of varying sizes. Six manos have grinding wear on one facet, 14 on two facets, and 4 on three facets. At least half of these manos exhibit battering wear on their ends and sides, suggesting that they were used for crushing in addition to grinding. Ground surface contours and end grinding indicate that 15 of the manos were used on trough metates and one on a slab metate. Eight are indeterminate. The manos were manufactured from sandstone (n=18), basalt (n=5), and rhyolite (n=1). Measurements range from 17.5 to 21.3 cm in length, 7.6 to 11.8 cm in width, and 1.7 to 5.0 cm in thickness. A single complete rhyolite mano was recovered from the floor of Feature 29. The remaining complete manos were recovered from the general fill of Feature 29 (n=3), Feature 35 (n=1), Feature 60 (n=1), and general site proveniences (n=2). A complete basalt mano from the general site collection has a red stain adhering to the surface, indicating involvement with pigment processing.

Rubbing stones are similar to one-hand manos but are generally smaller and relatively crude in form, with little or no shaping. The term *rubbing stone* was applied to these artifacts to distinguish them from the more formalized one-hand mano (Martin 1940:77). Only 3 of the 11 rubbing stones exhibit slight shaping by pecking or grinding. The rubbing stones are roughly round or oval in outline, with one flat or semiflat surface exhibiting definite grinding wear. Two specimens have battering wear on one or both ends. The rubbing stones are small enough to have been held in one-hand. Lengths range from 9.3 to 15.8 cm, widths from 7.1 to 10.1 cm, and thickness from 2.2 to 6.7 cm. The artifacts were all manufactured from basalt. The exact nature of the base stone on which the tools were used is unknown. They most likely represent an expedient grinding tool employed in a variety of activities. The largest concentration of rubbing stones (n=5) came from the general fill of Feature 31.

Metates are represented by three end fragments. Two trough metates were constructed from sandstone. Open- or closed-end troughs could not be distinguished from the fragments. One of the trough metates was found on the floor of Feature 59. The third metate is most likely a basin metate, but the ground area is too fragmentary to be certain. This metate was manufactured from basalt and found in the fill of Feature 29.

Lapstones. Six basalt stones were probably used both as working surfaces and base stones for grinding. These artifacts are smaller than metates and generally are bulky and irregular in form, with no evidence of shaping. Two are fragmentary. The lengths of the specimens range from 17.2 to 33.0 cm, widths from 7.1 to 16.4 cm, and thicknesses from 5.0 to 7.6 cm. Grinding surfaces are very ephemeral, resulting from use and intentional surface preparation. Four exhibit shallow

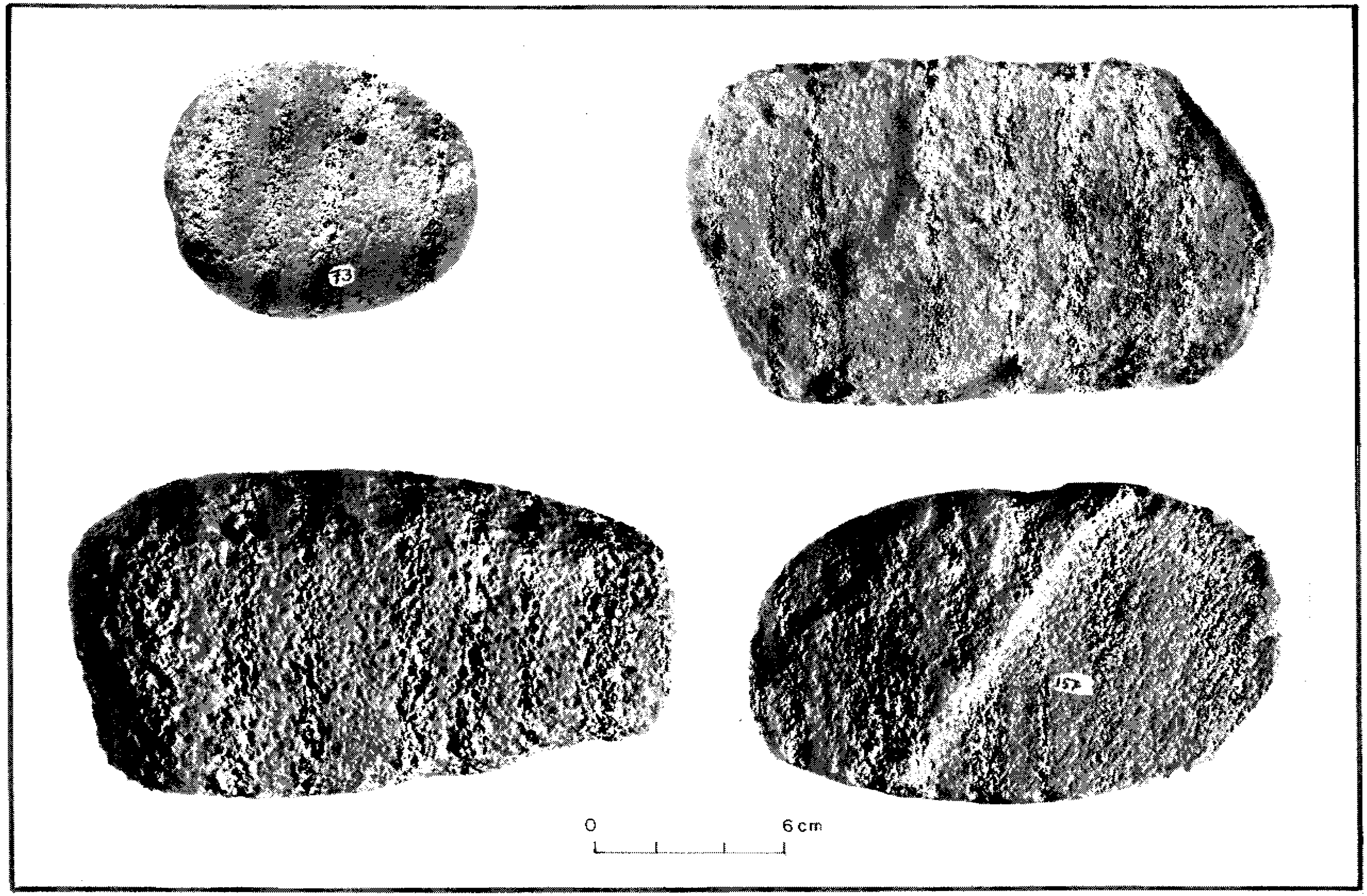

Figure 56. Manos, LA 6076: top left, FS 12H-5; top right, FS 35-5; bottom left, FS 41-27; bottom right, FS 29-58.

concave surfaces. The artifacts probably represent an unspecialized tool employed during a variety of activities. A red pigment stain is present on a lapstone from the general fill of Feature 28.

Palettes. Three thin slabs exhibiting at least one ground surface with visible remains of red pigment were classified as palettes. Two of the slabs, both of sandstone, are roughly rectangular in outline, with pecked and ground edges around all four sides, and one has a finely ground surface. These two slabs measure 24.8 by 14.7 by 2.3 cm and 27.1 by 14.0 by 2.5 cm. They were positioned together on the floor of Feature 29. The third specimen is a circular basalt slab with two flat surfaces, both exhibiting red pigment. This slab measures 1.52 by 12.4 by 2.6 cm and was found on the floor of Feature 59.

Mortar. An unshaped basalt boulder with a natural deep concavity enlarged slightly through grinding wear was found in the general fill of Feature 31. The artifact most likely represents a curiosity piece expediently employed as a mortar.

Hoes. Three artifacts have been classified as hoes. One large rhyolite flake is roughly oval in outline, with bidirectional flaking around the entire perimeter. Chipped areas on the lateral edges suggest the implement was hafted. The distal end is convex and exhibits sight grinding wear. This hoe was collected from the general nonfeature provenience.

The other two specimens are thin blades of fine crystalline basalt that have been unidirectionally flaked around their edges. One fragmentary piece is rectangular in outline with rounded corners, and one finely ground, highly polished surface exhibits a slight residue of pigment. The fragment measures 8.1 by 7.8 by 0.7 cm and was found on the floor of Feature 28. The other specimen is triangular in outline with side notches 2.6 cm below the convex base. The tip is convex, with no visible wear. The artifact measures 17.5 by 6.0 by 1.0 cm and was recovered from the general fill of Feature 31. Both of these specimens are similar in shape and size to artifacts from other Mogollon sites that are generally referred to as *hoes* (Haury 1936:36). They are also similar to the cultivating tools called *tchamahias*. It is not certain whether the tchamahias were employed as cultivating tools or were objects with ritualistic significance. The presence of red pigment stains on the specimen from Feature 28 suggests a ritualistic object.

Grooved abrading stones. Three grooved abrading stones consist of unmodified pebbles of basalt with abraded narrow grooves diminishing in a point. The stones range in length from 4.6 to 10.6 cm, in width from 2.0 to 7.8 cm, and in thickness from 1.9 to 3.5 cm. The length of the grooves ranges from 2.8 to 3.3 cm, and the width from 0.7 to 1.7 cm. The two specimens from feature proveniences are from below the floor of Feature 29 and the general fill of Feature 35. The tools were apparently used to grind tips of objects such as bone awls.

Polishing stones. These tools consist of alluvial pebbles with smooth, dense surfaces. The ten polishing stones are roughly oval or cylindrical, with one or more highly polished facets. They range from 2.0 to 6.2 cm in length, 1.8 to 4.0 cm in width, and 1.4 to 2.8 cm in thickness. Material types include quartzite (n=6), chert (n=3), and possible magnetite (n=1). Polishing stones were recovered from the floors of Features 35 (n=2) and 43 (n=1). The largest number (n=3) of polishing stones was found in the fill of Feature 28. Polishing stones are traditionally associated with the application of polish to ceramics prior to firing. The relatively high number of polishing stones from the site suggests local involvement with ceramic manufacturing.

Indeterminate worked slabs. This category constitutes the most numerous ground stone artifact class, with 27 slab fragments exhibiting shaped edges, and, in some cases, ground surfaces. The slabs were probably associated with a variety of functions, including door slabs, paving slabs, baking (piki) slabs, abrading stones, and expedient base stones or lapstones. Twelve small pieces exhibit shaping and at least one finely ground surface. One fragment with a general site provenience is heavily stained with red pigment. The slabs are primarily made of sandstone (n=21), followed by crystalline tuff (n=5) and basalt (n=1). Thickness ranges from 1.0 to 2.9 cm. The worked slabs have the widest provenience distribution: examples were recovered from most of the architectural features.

Stone pendant. A small mudstone pendant is roughly triangular in outline, with two opposing notched areas on the sides. Two holes have been drilled through the pendant, and the entire surface exhibits staining or residue from a red pigment. The pendant measures 2.3 by 1.3 by 0.3 cm and was recovered from the general fill of Feature 28.

Miscellaneous. Eight stones exhibit such minimal or fragmentary wear that they cannot be placed in a specific category. Material types include limestone (n=1), basalt (n=3), mudstone (n=2), and sandstone (n=2). Four specimens in this group were slightly shaped. One is rectangular, and the other three are disk shaped. Two spherical stone balls of sandstone and basalt were apparently shaped by stream action. These stone balls are 2.6 and 6.2 cm in diameter and were recovered from nonfeature proveniences.

Discussion. The ground stone assemblage seems typical of the diverse range of tools and activities expected at a residential site. The abundance of two-hand manos indicates that maize processing was an important subsistence activity. These large manos accommodate more material and allow the application of more force than the smaller one-hand manos (Chapman 1977:423). This technological response to the agricultural subsistence strategy is more amenable to the processing of dried maize kernels. In contrast, wild-food processing often associated with one-hand manos and basin metates appears to be a subsidiary subsistence activity.

In addition to food processing, the presence of red hematite on several of the ground stone tools indicates pigment processing, suggesting ritualistic activities. Specifically, the two sandstone palettes from the floor of Feature 29 could denote involvement of the room with special ritualistic activities. The two possible tchamahia are also imbued with symbolic significance; however, only the fragment from Feature 28 was from a floor-contact provenience.

Other activities suggested by the ground stone assemblage revolve around the employment of tools such as lapstones, rubbing stones, and grooved abraders for the maintenance and manufacture of other tools and crafts. For instance, polishing stones might indicate ceramic manufacturing.

The ground stone artifacts are primarily distributed throughout the fill of the rooms and pit structures. No specific activity areas were discerned. Since the majority of the largest artifact classes, two-hand manos and worked slabs, were fragmentary, the fill of the various architectural features most likely represents trash deposits, rather than roof-related activities. The artifact inventories from the rooms reveal a similar distribution of artifact classes. Similarly, no appreciable differences were noted between the assemblages from the pit structures and surface rooms.

Miscellaneous Artifacts

The miscellaneous artifact assemblage from LA 6076 consists of shell ornaments (n=4) and mineral specimens (n=14). A single complete *Olivella* shell bead was made by grinding the apex of the shell to make an aperture for stringing. The bead was recovered from a nonfeature provenience. Three small smoothly ground *Glycymeris* fragments are probably the remnants of bracelets manufactured from the cut perimeter sections of the bivalves. The two fragments from the roof fall and floor of Feature 28 are apparently from two discrete bracelets, with measurements of 1.0 and 0.6 cm. The remaining fragment is from a nonfeature provenience. Since the *Olivella* and *Glycymeris* shells probably originated in the Gulf of California, the shell ornaments are indications of the involvement of the site inhabitants in a trade network.

Mineral specimens include hematite (n=7), hematitic sandstone (n=2), red ocher (n=2), and yellow ocher (n=3). Five specimens have from one to four grinding surfaces, and the remaining pieces are small unaltered lumps of material. The red and yellow ochers are much softer than the hematite and crumble easily. The mineral specimens were probably used as paint stones for obtaining pigments. The largest of the angular pieces measures 3.5 by 2.5 by 1.5 cm. The mineral specimens were recovered from the general fill of Feature 29 (n=3), Feature 31 (n=4), Feature 60 (n=1), one of the jacal structures (Features 50 and 51; n=1), and the general site (n=5).

Faunal Remains

Flotation bone far outnumbered that recovered from the usual collection methods (n=549 to n=103) at LA 6706 (Table 63). A large number of flotation samples contained bone, mostly very small pieces that are often burned (56.3 percent). Six species of mice and one lizard occur only in the flotation samples. Few of these were burned, and they probably represent postoccupational intrusives.

Except for the flotation samples from heating features, structure excavations produced small samples of bone (Table 64). Similarly, "trash area" grids yielded no more than one bone per unit, with a single exception, in which three were recovered (n=15 grids) (Table 65). Just over a third (35.9 percent) of the nonflotation bone was checked or root etched--a figure that closely parallels the number of bones from medium or larger taxa (37.9 percent) and suggests that preservation was not the primary cause of the small sample recovered.

Rodent gnawing was relatively rare, observed on one specimen each from Features 28 and 29. Two are carnivore gnawed, a felid (*Felis* sp.) scapula from Feature 35 and a jackrabbit (*Lepus* sp.) bone from the Feature 58 fill.

Egg shell and a small number of bones suggest that turkeys were kept at the site. The shell was found in seven of the structures, including two of the earlier occupied ones, Features 59 and 60.

Relatively few immature or nearly mature small-mammal elements were recovered, but enough to suggest some warm-season occupation. Single elements from probable economic taxa were recovered from Features 29, 50, 57, and 59. Feature 60 had three, including one very immature jackrabbit element, which was burned. The sample size is far too small to draw any conclusions about animal exploitation by the site inhabitants. Artiodactyl elements are scarce. Only the white-tailed deer (*Odocoileus virginianus*)is present in the bulk assemblage.

Bone Tools

Eight bone awls and a possible scoop were collected from LA 6076. A complete awl (Fig. 57a) recovered from the fill of Grid 18G was made from a metapodial of an artiodactyl. The distal end is unmodified, and the proximal end is ground to a point. The length is 7.48 cm.

Another complete awl, manufactured from a proximal fragment of a metatarsal of a small artiodactyl, the size of a white-tailed deer, was recovered from Grid 2H at a depth of 0 to 15 cm. The surface is highly polished, with manufacturing striations along the edges above the tip. The tip exhibits rotary stria, possibly from use as a punch. It measures 8.2 by 1.3 cm.

A split metatarsal from a white-tailed deer was recovered from the lower fill of Feature 29. It had been split in half lengthwise and exhibited some polish and striations. It is 30.2 cm long.

An awl (Fig. 57b) from the general fill of Feature 35 is made from a fragment of an artiodactyl metapodial. The distal end has been removed, and the broken base was not recovered. The tip is ground to a point and polished by use. This specimen measures 20.3 cm.

Another complete awl (Fig. 57c) was recovered from the fill of Feature 41. It was made from a mule deer (*Odocoileus hemionus*) metapodial. The base is unmodified, and the tip is ground to a point. The length is 8.99 cm.

The left tibia of a jackrabbit (*Lepus* sp.) (Fig. 57d) was used for the awl recovered from the floor of Feature 59. The shaft is cut obliquely and ground to a point. The distal end is unmodified, and the awl measures 9.55 cm.

The tip of an awl was found from 0 to 30 cm below the floor of Feature 28. It was made from a medium to large mammal long bone shaft fragment and had a highly polished tip. A burned awl tip was also found in the floor fill of Feature 60. It, too, was manufactured from a medium to large mammal long bone shaft fragment and was well polished, with some manufacturing stria.

A small scoop or spoonlike object was manufactured from a split long bone of a large mammal. The bone is roughly triangular in outline, and the edges have been ground and polished. An X design is incised on the outside surface of the bone (Fig. 57e). The specimen measures 5.69 by 2.19 by 0.61 cm and was recovered from the floor fill of Feature 29.

Flotation Summary

The 21 flotation samples from LA 6076 produced small amounts of corn, beeweed, prickly pear, and yucca. Of interest is the low incidence of corn and slightly higher ubiquity of beeweed, which suggests a specialized use of that plant (Toll and McBride, this volume).

Summary

LA 6076 is the largest and one of the most substantially built of the Gallo project sites. Only LA 14906 has comparable wall construction. Since both of these sites are built on relatively steep hillsides, the inhabitants may have recognized the need for more substantial walls in these situations.

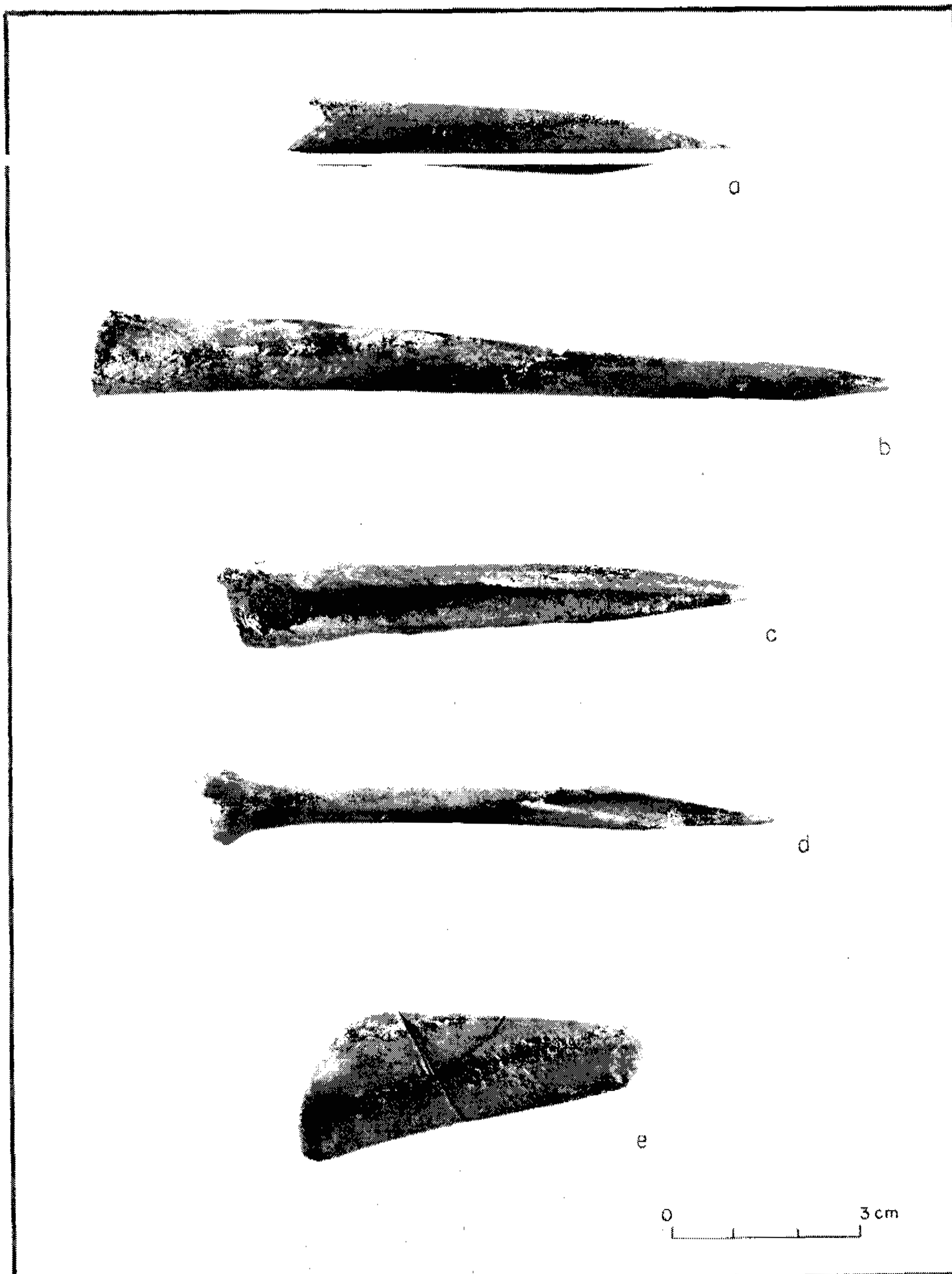

Figure 57. Bone tools, LA 6076: (a) FS 18G-5; (b) FS 35-3; (c) FS 41-26; (d) FS 59-26; (e) FS 29-64.

The superimposition of structures and indented white ware distributions indicate two occupations of the site. Features 59 and 60 had both burned, possibly leading to their abandonment, or were burned as the inhabitants left the site. The ceramics and dendrochronological dates suggest there was little time between the two constructions. The presence of Tularosa Black-on-white and Tularosa Patterned Corrugated on the floors of Features 28 and 29 suggests the later occupation lasted into the early A.D. 1200s. It is unlikely that the site was in use when neighboring LA 6075 was abandoned.

The variety of temper types (six types for eight sherds: Garrett, this volume), the shell, and the minerals suggest active exchange with areas to the north and other Mogollon groups. The array of artifacts certainly suggests a residential site, although the absence of features used as grinding facilities and the paucity of corn is perplexing.

LA 6077

LA 6077 is near the base of the western slope of a flat-topped ridge 220 m east of Largo Creek at an elevation of 2,212 m. The ridge slopes are covered with yucca, oak, piñon, and juniper. Grasses and groups of cottonwoods are found along Largo Creek (Kayser 1976:24).

Cultural Remains

The 1972 right-of-way survey recorded LA 6077 as a possible one-room masonry fieldhouse dating ca. A.D. 1100 (Kayser 1976:24). The 1976 survey reports two fieldhouses on different terraces of the slope and the possibility of a pit structure at the base of the slope (Kayser and Dart 1977).

Excavation Methods

Surface materials were collected, then a grid 12 m north to south and 5 m east to west was established over the site area. Eighteen of the 1 by 1 m squares were excavated to a depth of 15 cm (Fig. 58). No cultural remains were recovered in soil described as hard and dry, with some grass and pine debris. No evidence of architecture or other features was found.

Cultural Material

Ceramics

Eight sherds were collected from the surface. Five are brown ware body sherds, one a Reserve Smudged bowl rim sherd, another a Reserve Black-on-white bowl sherd, and the last a Wingate Black-on-red bowl sherd. The Reserve Black-on-white has a Kiatuthulanna/Red Mesa design. Additional sherd types observed outside of the right-of-way were Red Mesa Black-on-white and Reserve Plain and Indented Corrugated (Rayl n.d.).

Lithic Summary

Eleven lithic artifacts were recovered, 9 flakes, 1 angular debris, and 1 small chalcedony flake with utilized edges (Wening, this volume).

Summary

Excavations uncovered no evidence of a site. The 8 sherds and 11 lithic artifacts could have been deposited by residents of LA 6076, slightly to the north, or LA 14858, just to the south.

Figure 58. LA 6077 during excavation.

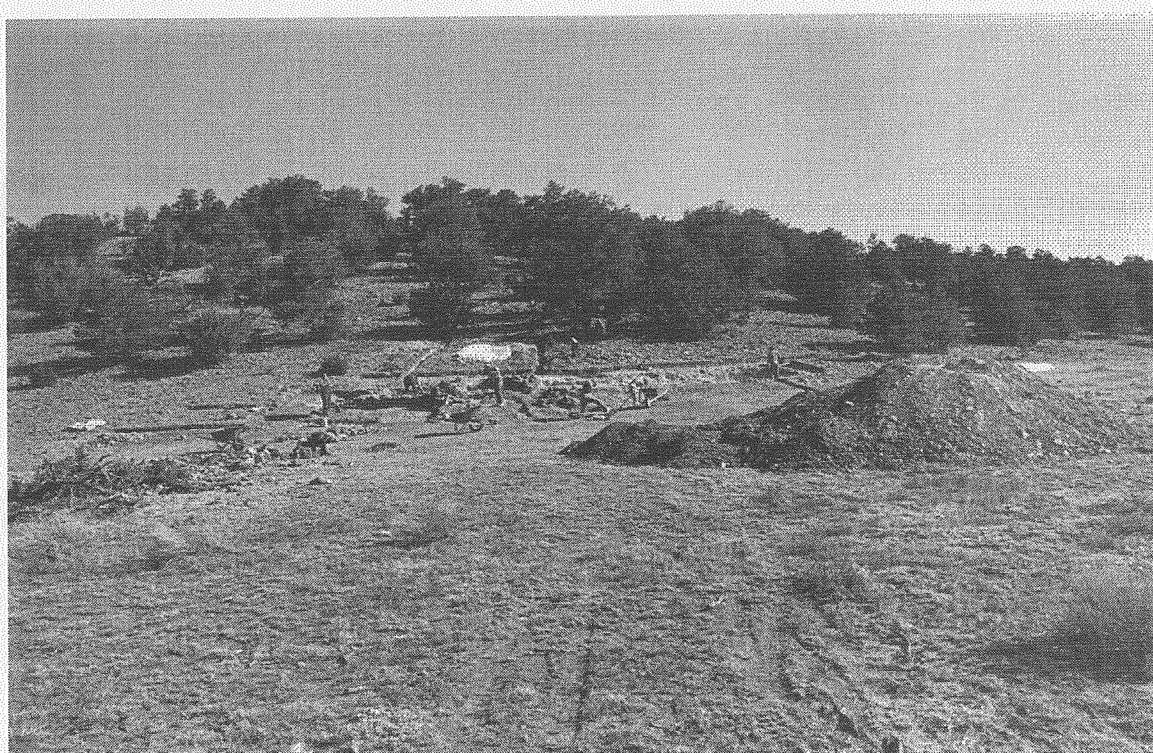

Figure 59. Overview of excavation, LA 14858.

LA 14858

LA 14858 is on the slope of a hill above a small rincon at an elevation of 2,217 m. Largo Creek is 200 m to the west, and arable land is immediately to the southwest in the valley bottom. Vegetation is piñon and juniper with sparse range grasses and narrowleaf and broadleaf yucca (Fig. 59).

Cultural Remains

Neither the 1972 nor the 1976 right-of-way surveys recorded this site, largely because there was no visible architecture, and fewer than ten sherds were observed at the base of the slope. In a final check of the right-of-way in November 1976, a Late Reserve/Early Tularosa phase site was suspected, but it was not until excavation began that architecture was found. Seven masonry rooms, a jacal room, and a pit structure were eventually located.

Excavation Methods

A grid system, 8.5 by 3.0 m, was established for control during surface collection and stripping. Unfortunately, the grid system was never tied into the site map, and Features 1, 2, 3, 4, 5, and 10 are not located at all or only vaguely located. Table 66 summarizes what information there is on the test features. Few of these were screened. Except for ceramics, cultural material was sparse, suggesting a relatively brief occupation or that trash areas were not encountered during the excavations.

Feature Descriptions

The roomblock consists of a loosely aggregated line of rooms with a pit structure at the east end (Fig. 60). The jacal and one partial masonry room were downslope from the main line of rooms.

Feature 11

Feature 11, the westernmost of the line of rooms, was a small room or covered work area (Figs. 61 and 62). Lower portions of the north and west walls were native earth. Upper walls were cobble masonry. The south and east walls were crude ashlar cobble masonry. Room dimensions were not recorded. They are estimated at 2.1 by 2.2 m, an area of 4.6 sq m (Table 67).

Fill consisted of rock, hard clay, and laminated silt with sparse cultural material. The floor was native earth covered by an eroded layer of clay. The depth of the floor below surface was not recorded; however, fill artifacts were recovered from 0 to 45 cm, and the floor-fill level was 5 cm. Nor were floor features recorded, although the field journal refers to several postholes along the perimeter, and the bipod photos show four possible postholes, a slot, and a larger feature or disturbed area. A scraper is listed on the field specimen sheets as recovered from a depression in the southeast corner.

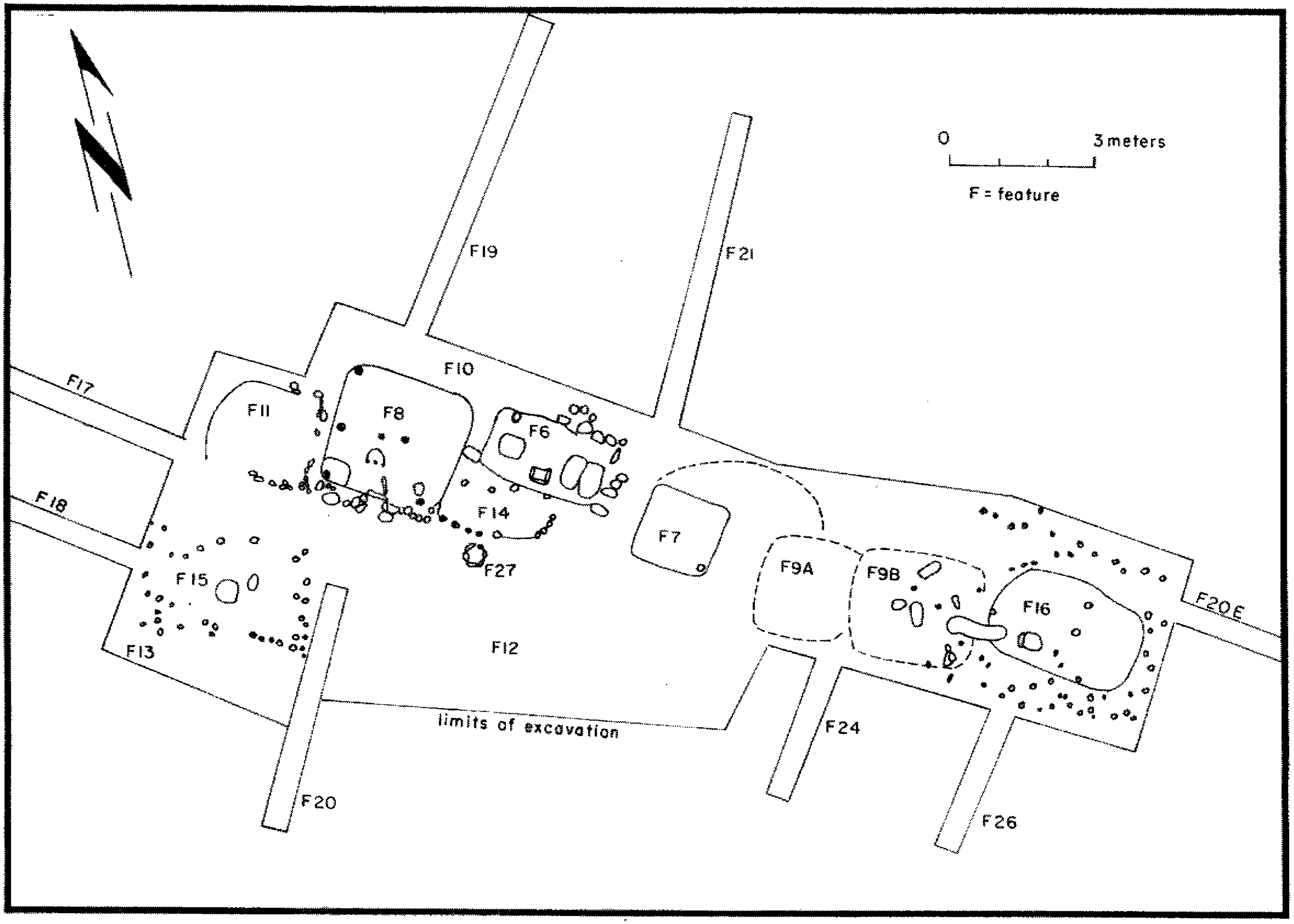

Figure 60. LA 14858 site map.

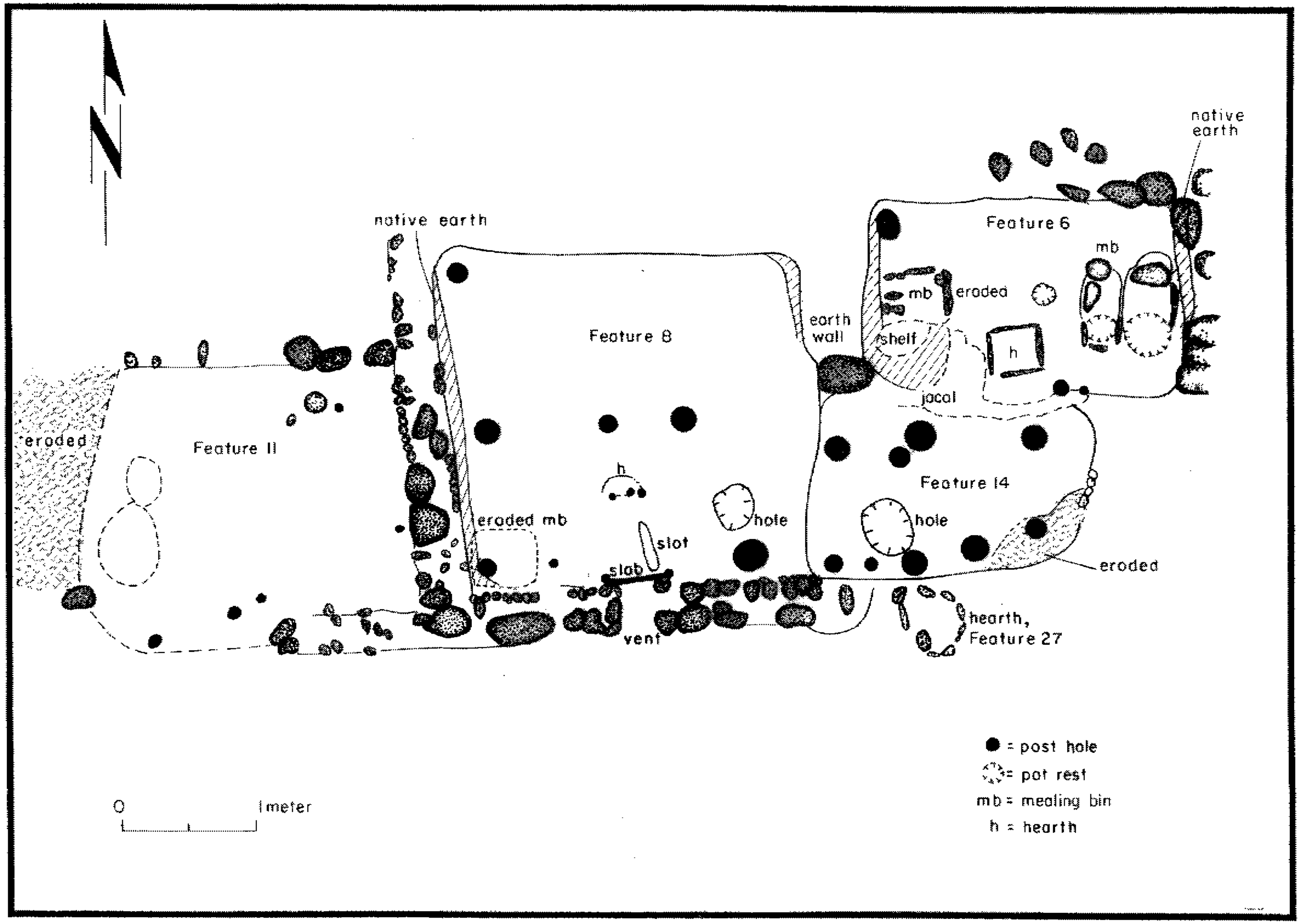

Figure 61. Features 6, 8, 11, 14, and 27, LA 14858.

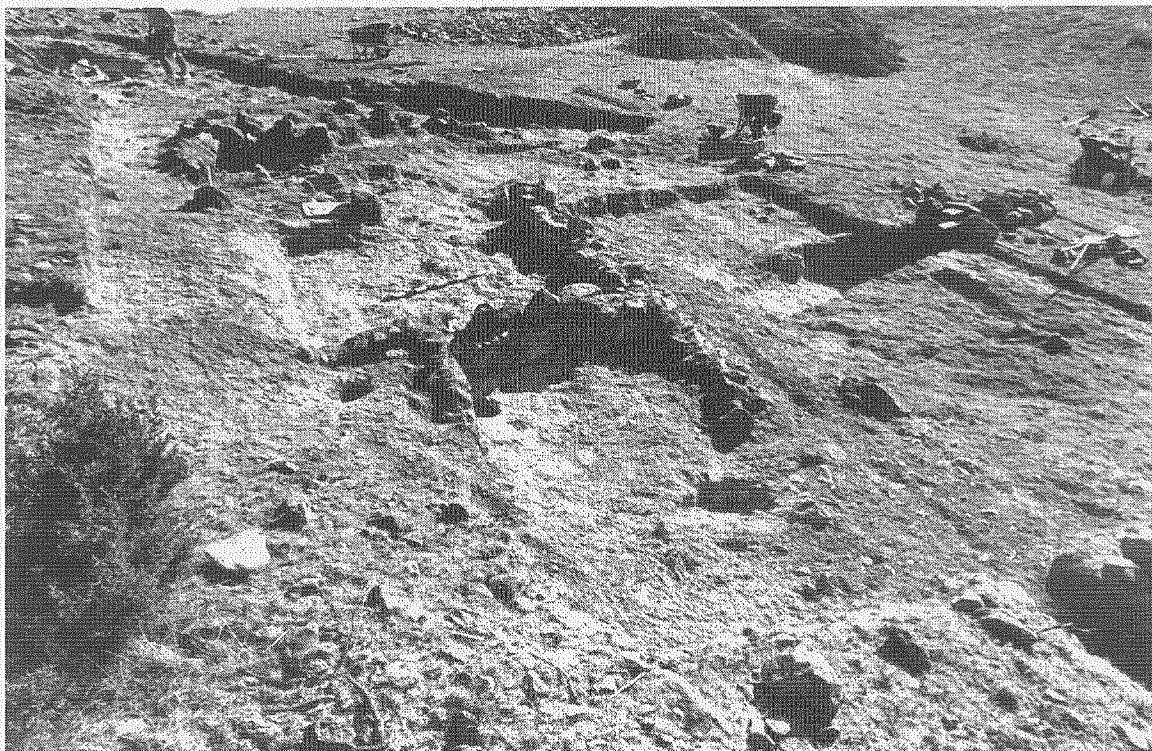

Figure 62. Features 6, 8, 11, and 14, LA 14858, looking northeast.

Figure 63. Feature 8, LA 14858.

Feature 8

The second room in the line, Feature 8, one of the larger rooms, has an area of 5.86 sq m (Fig. 63). It is nearly square with rounded corners. The north wall, cut into the hillside, was of native soil. The upper portion was absent. The remaining walls were constructed of fist-sized cobbles in a clay mortar. Masonry consisted of 15 cm wide bands of small cobbles alternating with large cobble ashlar bands. The masonry was described as stable, if not neat, in appearance. Wall dimensions were as follows: north 84 cm high, south 37 cm high and 44 cm wide, east 25 cm high, and west 56 cm high and 33 cm wide.

Fill was very rocky, hard, organically stained laminate clay with little cultural material. A metate and several worked slabs were found 20 cm above the floor. The floor, at 72 cm below the modern ground surface, was a sterile off-white semiconsolidated volcanic sediment covered by thin layers of clay. A 1.44 m wide door in the east wall opens into Feature 14. A 31 cm wide vent with a slab cover was situated in the center of the south wall.

Floor features include a small semicircular hearth, 31 by 12 cm in diameter and 15 cm deep, primary and secondary deflector slots, traces of a mealing bin, a possible pit, and six postholes. The mealing bin was in the southwest corner and measured 42 cm north to south, 49 cm east to west, and 5 cm deep. A possible pit or hole in the southeast corner measured 30 by 45 cm and was 24 cm deep. Posthole diameters were as follows: southeast corner 25 cm, southwest 16 cm, center of west wall 26 cm, center of east wall 24 cm, and northwest corner 20 cm.

Feature 6

Feature 6 was the first room identified. It was rectangular and had an area of 3.15 sq m. Lower portions of the walls were native earth with cobble ashlar masonry on the north, east, and west walls. The south wall may have been open or jacal. The maximum wall height was 48 cm along the north wall.

The floor was 60 cm below ground surface and consisted of native volcanic white marl. Fill was rocky, hard, charcoal-stained and organically stained clay with sparse cultural material. The room was packed with features, including three mealing bins, a hearth, a bowl rest, and three postholes (Fig. 64). The hearth was rectangular with sides formed by four thin sandstone slabs. The slabs were 2-4 cm thick, with edges and sides chipped and ground. The hearth measured 32.7 cm square by 37 cm deep and had a 2.5 cm thick clay base, which was burned dark brown. The easternmost mealing bin measured 35 by 89 cm and had a bowl holder 30 cm in diameter. The middle bin was 26 by 66 cm with a 22 cm diameter bowl holder formed by three vertical slabs. The bin was slanted at the base, with the north end 6 cm below the floor and the south end 17.5 cm below the floor. The western bin measured 135 by 56 cm and was 16 cm deep. It contained two manos.

No measurements were recorded for the central bowl rest. The northwest corner posthole was oval, 16 by 25 cm and 9 cm deep. The postholes along the south wall measured eight and 13 cm in diameter and were shallow, 7 and 13 cm. The array of features and lack of floor space suggest this room was used primarily for food preparation.

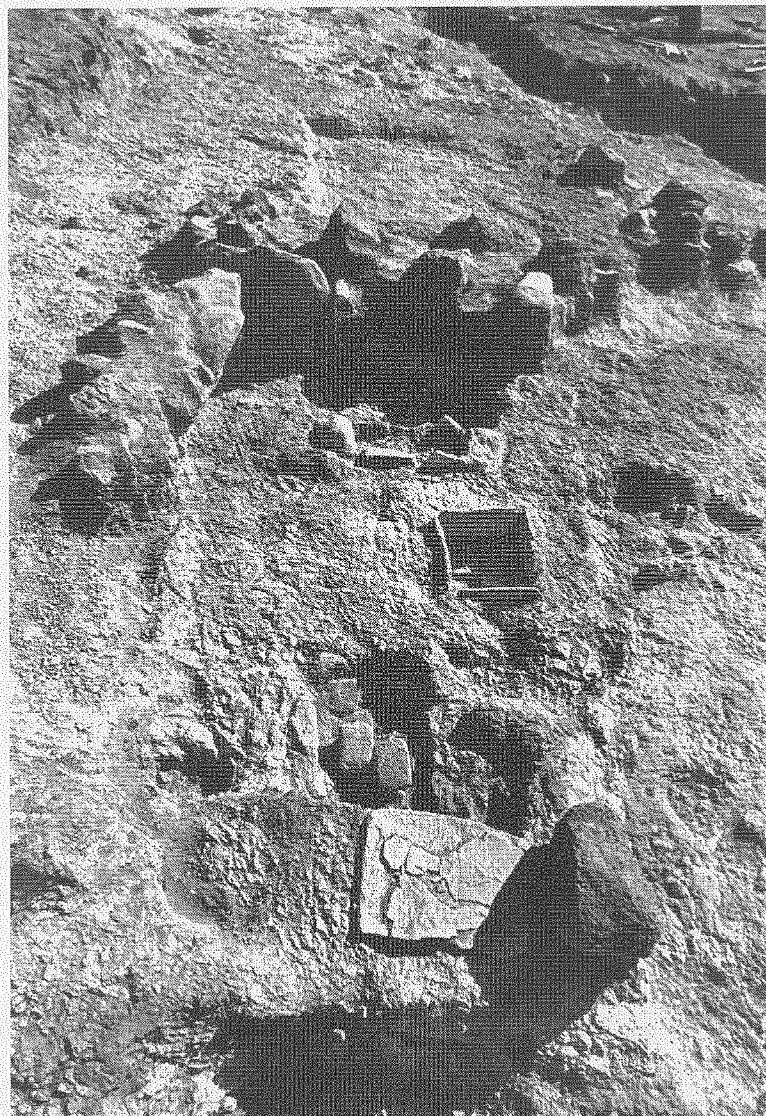

Figure 64. Feature 6, LA 14858.

Feature 14

This small room was just south of Feature 8 and west of Feature 6 (see Fig. 61). The floor was 28 cm lower than that of Feature 6 and 15 cm lower than that of Feature 8. No walls remained to separate the three features, although a row of small postholes lay between Features 6 and 14. The three rooms appear to have functioned as a unit, possibly for storage, living, and food preparation.

Feature 14 was rectangular, with an area of 2.99 sq m. The lower walls were of native earth, and the uppers ones were of coarse ashlar cobbles, except for the northern jacal wall. Wall heights were 36 cm for the north, 40 cm for the south, 17 cm for the east, and 12 cm for the west.

The floor was roughly 75 cm below the surface and consisted of a thin layer of clay over sterile soil. Fill was rock in laminated sand and silt with a small amount of cultural material. The only features in the room were a hole or pit, 38 by 48 cm in diameter and 17 cm deep, and nine postholes. The posthole diameters ranged from 9 to 24 cm.

Feature 7

Feature 7 is a small, 2.78 sq m, featureless room immediately east of Feature 6 (Fig. 65). It was rectilinear. The lower portions of the walls were excavated into the hillside and made of native earth. The upper walls were ashlar cobble masonry. Cobbles were missing from the north wall. The south wall, which could not be discerned, may have been jacal. There was a single posthole in the southeast corner.

The floor, 72.8 cm below ground surface on the north side, was of native earth, probably covered by a thin layer of clay. Fill was very rocky, organically stained, hard clay with sparse cultural materials. The only feature was a posthole 17 cm in diameter.

Feature 23

Feature 23 was described as a partial room excavated into the hillside just east of Features 7 and 9A (Fig. 65). The lower walls were of native earth in poor condition, and large portions were disturbed by later construction. The floor, 38 cm below the modern ground surface, was native white consolidated volcanic tuff covered by a thin layer of off-white clay. Fill was rocky, sandy, silty soil. No features were found, and the room was not mapped.

Feature 9A

Feature 9A, southeast of Feature 7, was a small storage room that may have been associated with Feature 9B (Fig. 65). Feature 9A was rectangular with rounded corners and had an area of 2.23 sq m. Lower walls excavated into the hillside were of native earth. None of the upper walls remained. The eroded floor was 39 cm below the modern ground surface. Fill was rocky, hard clay and laminated silt with few cultural materials. No features were reported, and the room was not mapped.

Feature 9B

Feature 9B was just east of Feature 9A (Fig. 65). Unfortunately, it was not mapped either. The structure is noted as having a gentle curve in the rear wall. Lower walls were cut into the slope and made of native earth. The upper walls were missing, but some were probably of cobble ashlar. The north wall was 45 cm high with "several" perimeter postholes, and interior postholes along the east and southeast walls suggest some were of jacal. Thin plaster was found over portions of the native earth.

The floor was 75 cm below the present ground surface. It consisted of a layer of clay over native earth. Fill was very rocky, hard clay and silt with sparse cultural material. A number of features were recorded. A circular hearth in the center of the room was a shallow pit 50 cm in diameter. In the northwest was a disturbed pit 33 by 58 cm in diameter and 24 cm deep, which may have been rectangular. A basin-shaped storage pit in the southeast measured 45 by 38 cm in diameter and 22 cm deep. Also in the southeast corner was a rectangular pit 31 by 55 cm and 18 cm deep. Centered between the rectangular pits was a posthole 12 by 19 cm in diameter. The

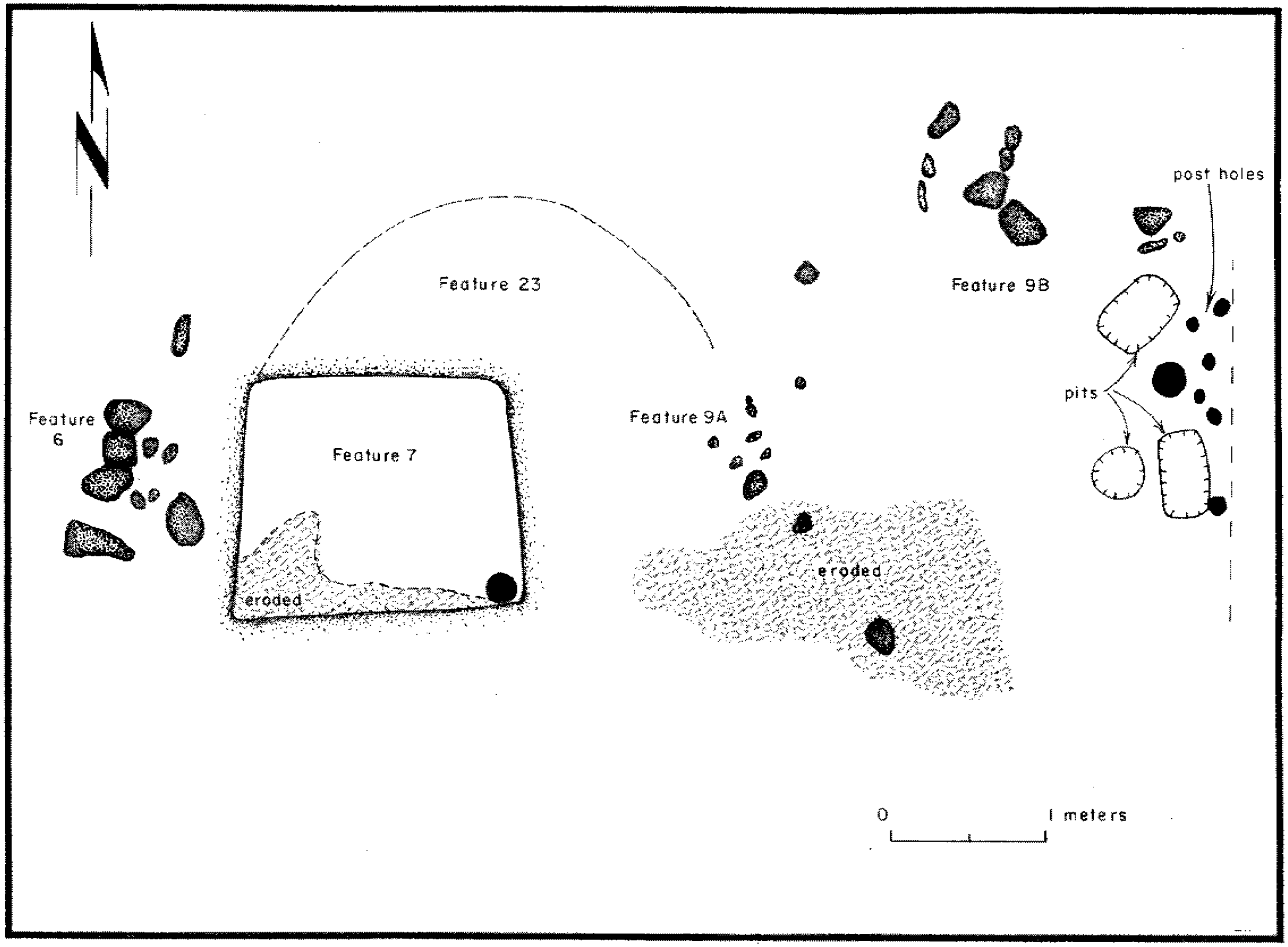

Figure 65. Features 7, 9A, 9B, and 23, LA 14858.

presence of other postholes is noted, but numbers or dimensions are not given. A dendrochronological sample from this room was submitted but did not date.

Feature 16

At the end of the line of rooms is the pit structure, Feature 16 (Figs. 66 and 67). It was rounded rectangular with a floor area greater than 7.52 sq m. Lower walls were of native earth. Upper walls of jacal are indicated by perimeter postholes at the prehistoric ground level. Wall heights were 77 cm in the north, 28 cm in the south, 59 cm in the east, and 34 in the west. Walls were in fair condition, with small patches of thin tan-white plaster adhering to the north wall. The wall top was 0.49 m below ground surface in the north, and the floor was at 1.08 m. The south wall top was 0.32 m below prehistoric ground surface and 0.61 m below the present ground surface.

Fill was rock in layers of laminated silt and clay, with small amounts of cultural material. The floor was native off-white consolidated tuff, covered in spots with a thin layer of plaster. Five possible footprints in two sets were found along the north edge.

The ventilator was at the south end of the west wall. The trench measured 48 by 104 cm. Two small tunnels on opposite sides of the main tunnel provided additional intake. A cist was excavated into the wall in the east corner. The opening measured 41 cm high by 33 cm wide. No depth was recorded. The floor cist measured 23 cm at floor level, 33 cm at the bottom, and 37 cm deep.

The main hearth was rounded rectangular, with a slab on the side of the vent opening. It was ash filled and measured 39 by 76 by 10 cm deep. A slot for a deflector slab was found at the edge of the vent opening. A secondary hearth, in the northwest quarter of the room, was a shallow basin with a burned interior measuring 22 by 24 by 6 cm deep. Two of the four bowl rests measured 20 by 25 by 11 cm deep and 26 by 28 by 6 cm deep. The other two were not recorded.

Eighty-three postholes were found. Most were on the perimeter at the prehistoric ground level. Others clustered in the southeast corner or were spread throughout the interior. Table 68 divides these into directional groups for comparison, showing considerable variation in the size of the posts. Slightly larger posts were used for the south and east walls.

Feature 15

This large, 10.98 sq m jacal structure was west and downslope from the line of rooms. The area was rectilinear, with posts on all sides (Fig. 68). The north wall was slightly excavated into the slope. The south was indicated by postholes and rocks aligned with the postholes. East and west walls were indicated by postholes. Double lines of posts were found on the west, south, and east sides.

The floor, at 25 cm below the modern ground surface at the center, was a 5 to 8 cm thick layer of clay taken from along Largo Creek. Fill was the usual rock in silty clay. Floor features include a circular hearth 48 cm in diameter and 12 cm deep and an ashpit (27 by 45 by 12 cm deep) filled with white ash. Forty-one vertical postholes were recorded; four were rock lined. Table 64 summarizes the dimensional information.

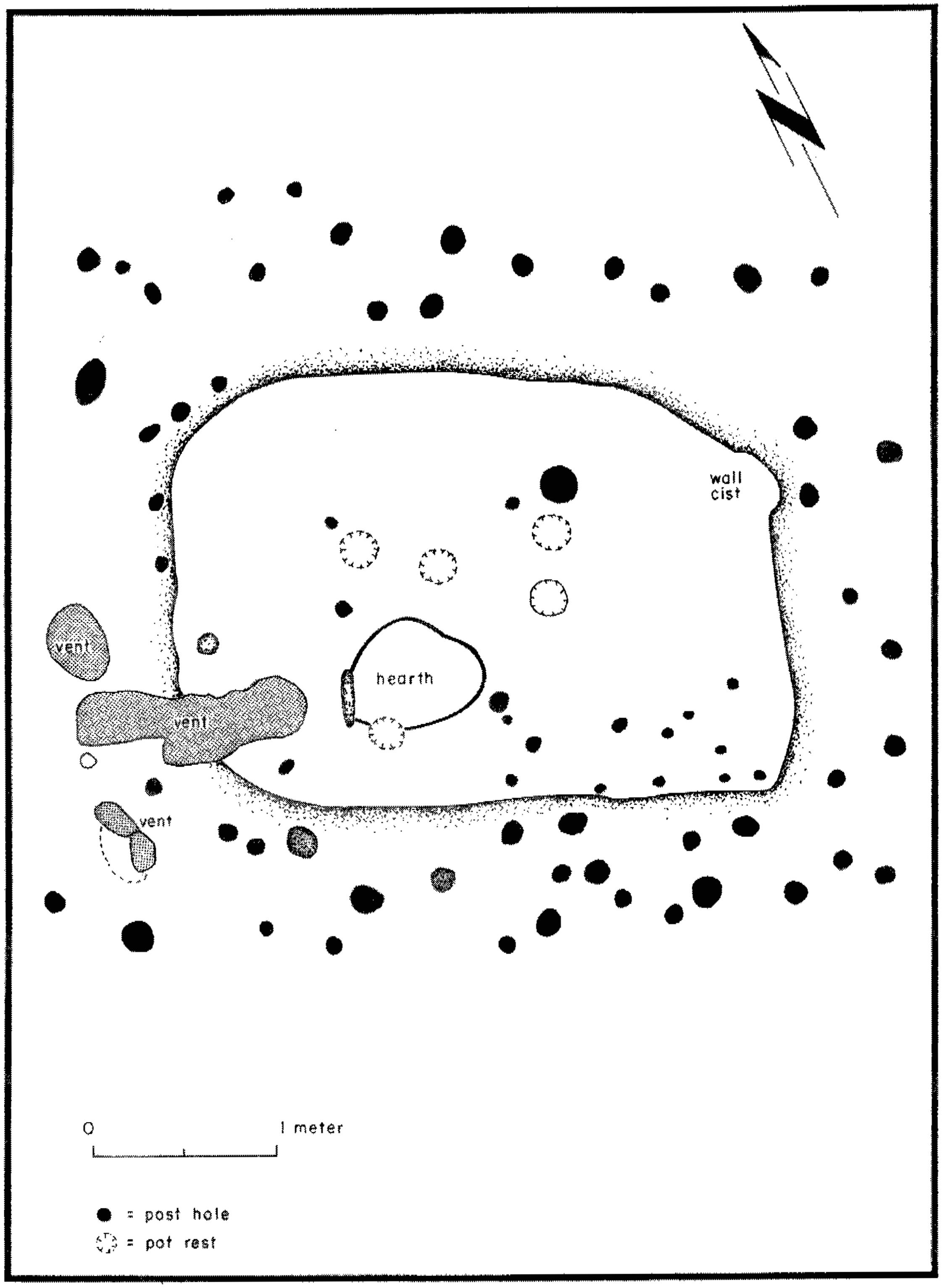

Figure 66. Feature 16, LA 14858.

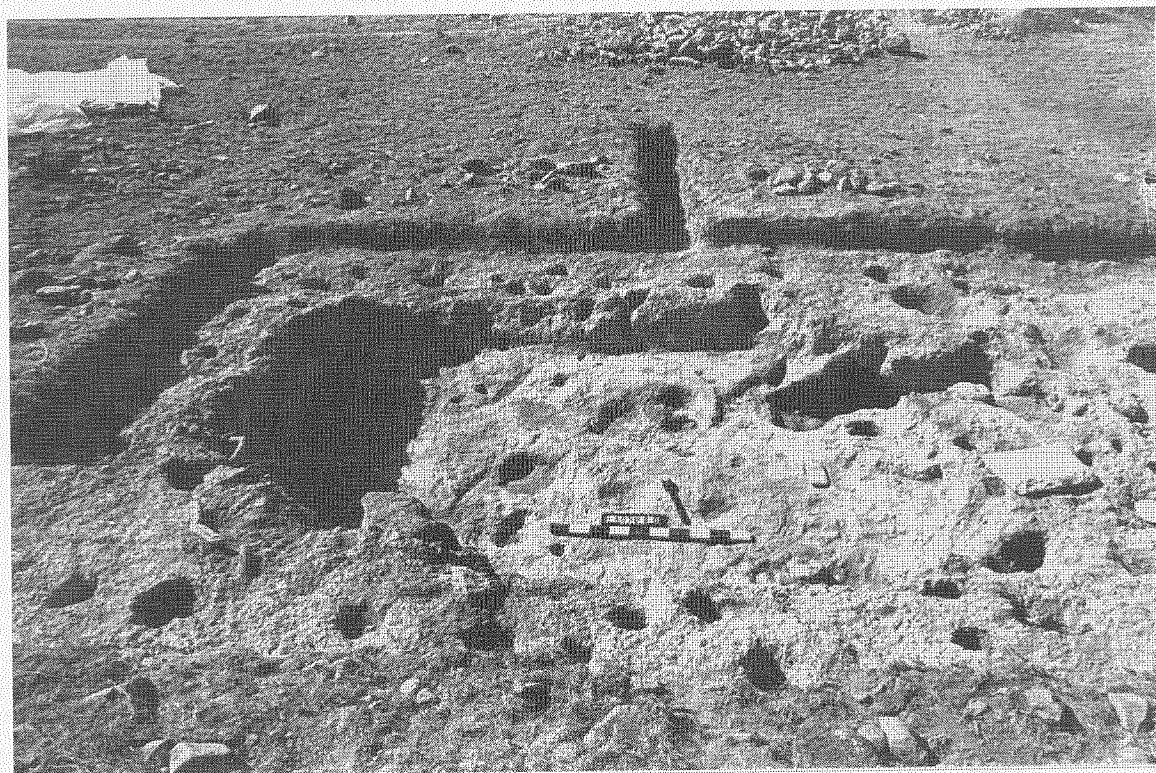

Figure 67. Feature 16 after excavation, LA 14858.

Exterior Firepit

A slab-lined firepit, Feature 27 (Fig. 69), was located 17 cm south of the southwest corner of Feature 14. It measured 41 by 46 by 19 cm deep. The firepit was rectangular and lined with thin volcanic slabs on the sides and base. Clay was banked up around the slabs, and the upright slabs protruded 8 cm above the prehistoric ground surface. It was 22 cm below the modern ground surface.

Cultural Materials

Ceramic Wares

A total of 1,209 sherds were analyzed from LA 14858, including four partially reconstructed vessels. The number and variety of sherds is considerable given the site size. Other material types are not nearly so well represented. Several of the ceramic types recovered are found only at this site or occur infrequently, including Mimbres Black-on-white, Mimbres Corrugated, and Tularosa Filet Rim. The range of dates represented by the assemblage is also considerable: San Francisco Red and Kiatuthlanna Black-on-white at the early end, and St. Johns Black-on-red and Tularosa Black-on-white at the late end. The following descriptions of reconstructed vessels is based on Plettenberg (n.d.).

A third of a deep, almost straight-sided bowl was recovered from Feature 9. It measures at least 13.5 cm at the mouth and is 16 cm deep. It has 0.7 cm thick walls and an 0.9 cm thick base.

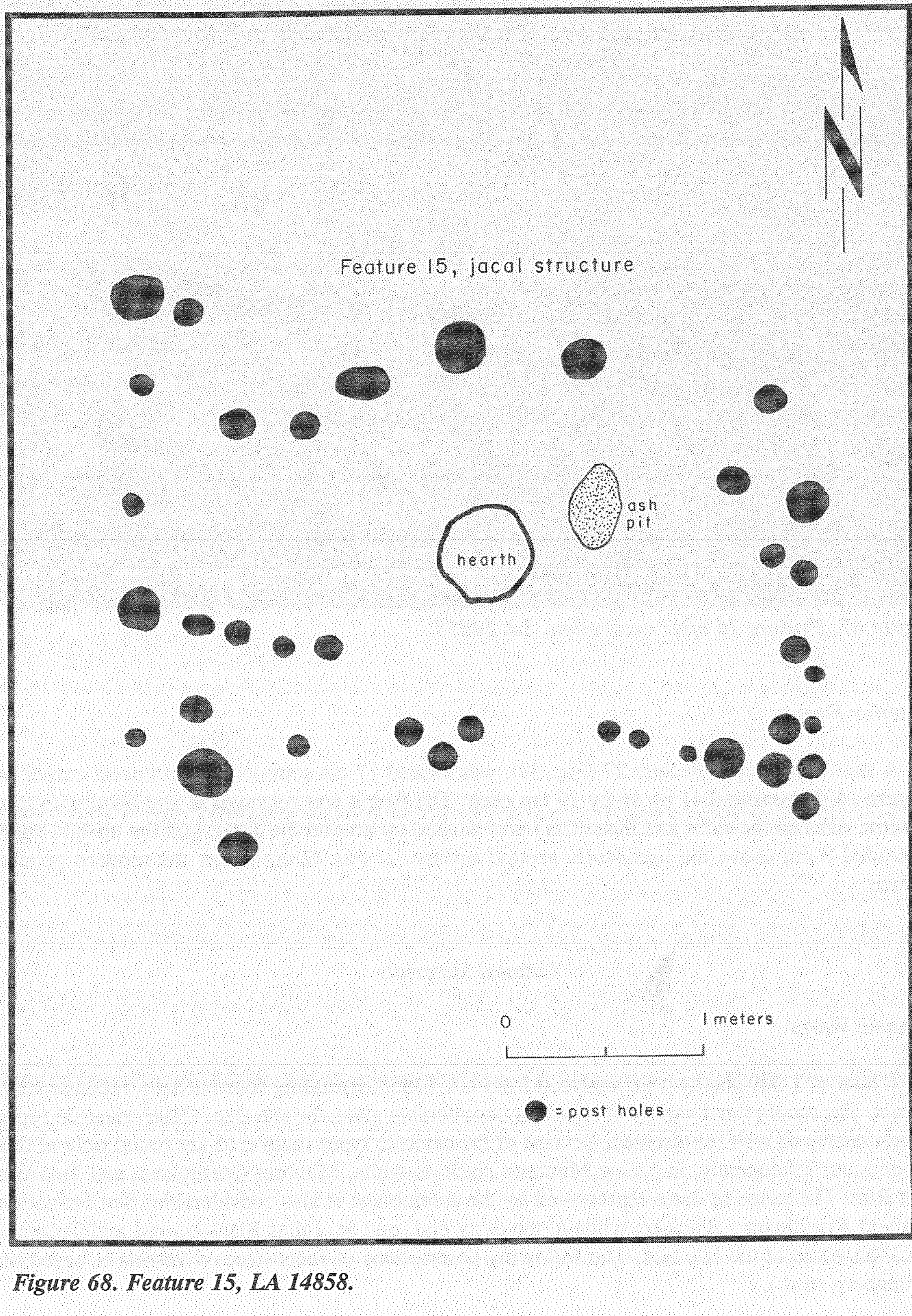

Figure 68. Feature 15, LA 14858.

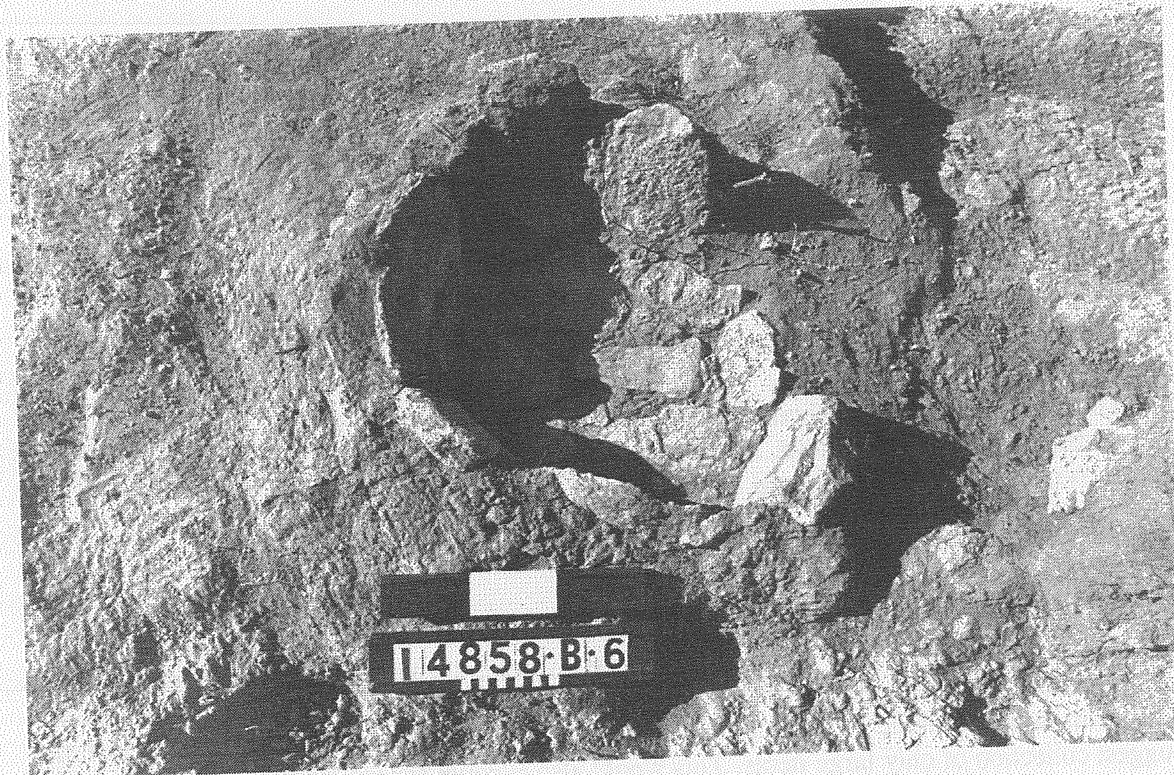

Figure 69. Feature 27, LA 14858.

The interior is smudged and polished and has a crazed surface. The exterior is fire clouded over half the surface, and the base is well worn. The rim is rounded and slightly everted. The other utility vessel was a Mimbres Corrugated jar found primarily in Feature 6. Much of the upper third of the vessel was restored, indicating a mouth diameter of approximately 20 cm. The interior was smoothed by floating, and the exterior was evenly coiled and indented and smoothed. There are five rows of corrugations for each 2 cm. Near the shoulder, four rows of plain corrugations alternate with five, two, and one row of indenting. The rim is everted 90 degrees and is 1.4 cm wide.

A quarter of a Wingate Black-on-red vessel was found on the floor of Feature 7. It has a mouth diameter of 28 cm, it is 15.1 cm deep, and the walls are 0.5 cm thick. The interior is covered with a red slip, not well smoothed, which has a Tularosa design. The exterior is unevenly slipped and not well smoothed. The rim is direct and simple.

The lower third of a Tularosa Black-on-white duck effigy pitcher was recovered near the surface in Feature 9B. The interior is smooth with visible scraping marks, and it has a polished slip over an uneven surface. The design is an interlocking stepped design. Vessel walls are 0.4 cm thick.

A number of worked sherds or sherd artifacts were also recovered. Table 69 gives the particulars on these artifacts. Possible scrapers and a number of drill holes were found.

The Reserve series dominates the assemblage, comprising 61.3 percent of the total, including similar percentages of Reserve Indented Corrugated; Indented Corrugated, Smudged; Plain Corrugated; and Plain Corrugated, Smudged. The Tularosa series represents only 15.1 percent, and the indented white wares are negligible, at 0.2 percent.

The distribution of sherd types (Tables 70 to 75) suggests contemporaneous use of the rooms. Tularosa Black-on-white and St. Johns Black-on-red are found in virtually every room. While the earlier wares do have a more restricted distribution, they cooccur with Tularosa Black-on-white and St. Johns Black-on-red. Feature 16 produced a single Tularosa Black-on-white sherd from the fill. The virtual absence of later wares may suggest the pit structure was abandoned before the rooms (Table 75). There is also some suggestion of stratified deposits in Features 1 through 3, because the deepest level has none of the Tularosa series. Unfortunately, most of the deep tests were excavated in massive levels--as thick as 2 m--and no conclusions can be drawn.

The most unusual thing about the site assemblage is the number of sherds recovered (Table 76). Lithic artifacts, ground stone, and bone are all sparse. The quantity and range of dates for the sherds is out of proportion with the other artifacts classes and features at the site.

Lithic Summary

LA 14858 has an unusual lithic assemblage, consisting of 24 flakes, 1 angular debris, 25 tools, 3 cores, and a hammerstone. Tool types include shavers, knives, scrapers, and notched tools. Chert/chalcedony is the primary material type for the debitage and tools (Wening, this volume). The small sample of lithic artifacts is problematic given the number of sherds recovered and may suggest collection of only large items. This would also account for the large number of tools and the paucity of flakes.

Ground Stone, by Charles A. Hannaford

The ground stone assemblage from LA 14858 consists of 44 artifacts. The majority represent grinding implements (Table 77). Material types include sandstone (n=17), basalt (n=15), vesicular basalt (n=6), crystalline tuff (n=4), andesite (n=1), and quartzite (n=1).

Manos. A single one-hand mano of vesicular basalt was recovered from the general site surface. The mano is circular in outline, with fingerholds pecked into the sides. Grinding wear on the working surface is very rough. Striations suggest use on a basin metate. The one-hand mano measures 12.0 by 8.0 by 8.2 cm.

The mano artifact class is composed primarily of two-hand manos (n=17) (Fig. 70). These manos are thin slabs with roughly rectangular outlines. Twelve are complete, and five are fragments. The manos were manufactured from tabular sandstone (n=12) and vesicular basalt (n=5). The majority (n=9) of the sandstone manos have battering wear on their ends and sides. Of the 17 specimens, eight exhibit grinding wear on one facet, eight on two facets, and one on three facets. Dimensions of the complete manos range in length from 14.0 to 21.0 cm, in width from 7.0 to 12.0 cm, and in thickness from 1.6 to 6.2 cm. Contour shape and end grinding indicates that nine specimens were used on trough metates and two on slab metates. Six are indeterminate. Maize processing is the main activity exemplified by the manos; however, a single specimen from a nonfeature provenience is covered with a red stain, indicating pigment processing. In addition, the two vesicular basalt manos from the general fill of Feature 6 have highly polished grinding surfaces. This polish most likely resulted from processing of fine-grained materials such as highly pulverized cornmeal or perhaps clay. Utilizing the manos in a secondary activity such as floor polishing might also account for the polished working surfaces. This room does contain

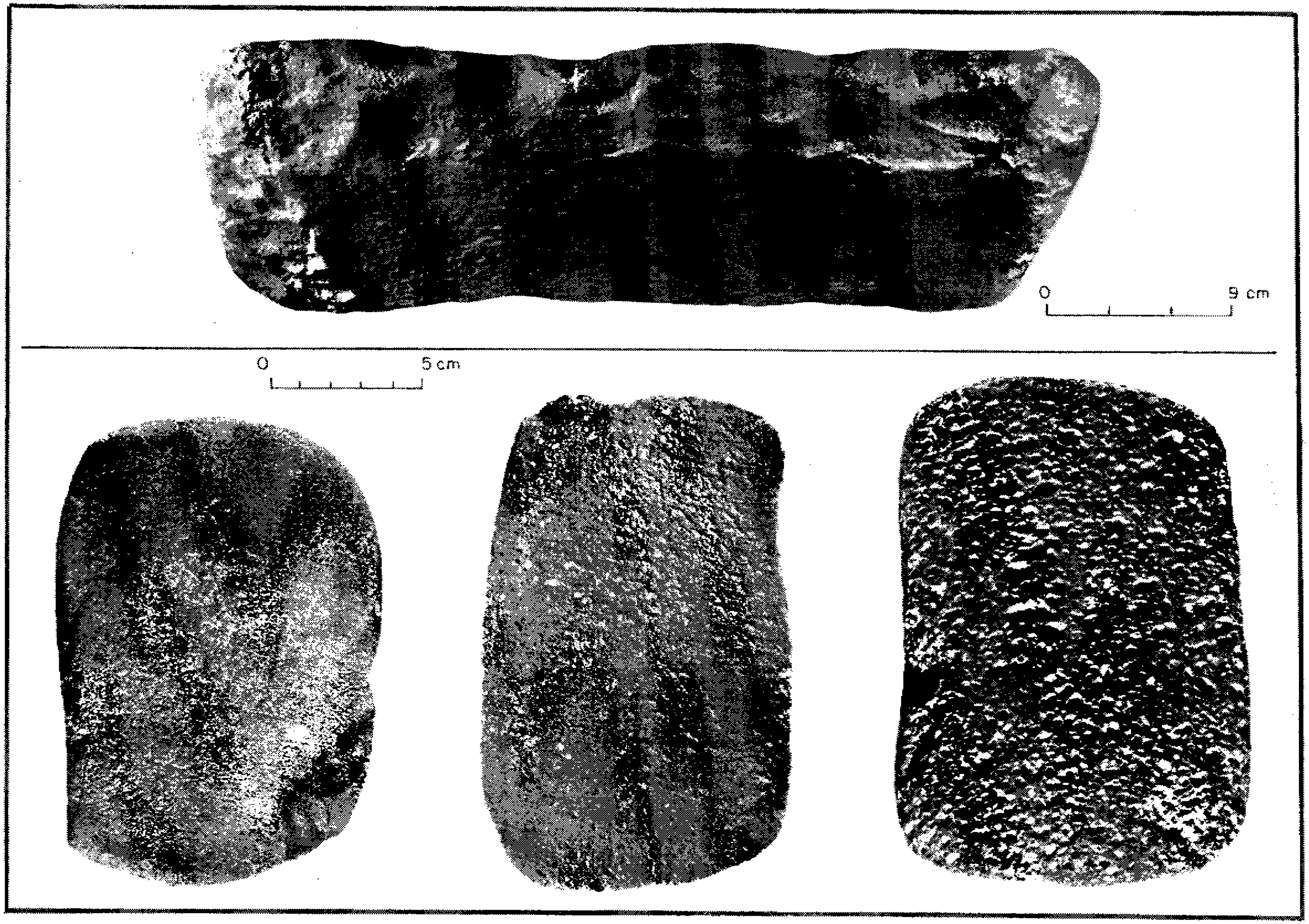

Figure 70. Ground stone, LA 14858: top, no field sample number; bottom, left to right: FS 9B-11, FS 16-24, FS 6-15.

three mealing bins, indicating food processing. Other two-hand manos were distributed throughout the fill of the architectural features but were in actual floor contact only in Feature 9B (n=2) and the pit structure (n=1). All were complete sandstone manos.

Rubbing stones. This artifact class consisted of six basalt waterworn stones exhibiting little or no shaping. Three are relatively small unshaped stones ranging from 5.0 to 7.0 cm, 1.3 to 9.0 cm, and 2.7 to 5.7 cm. These are roughly oval in outline, with at least one finely ground flat or convex surface exhibiting a gray stain. The other three stones are slightly larger, ranging from 7.3 to 10.2 cm, 5.0 to 12.5 cm, and 5.4 to 8.0 cm. One of these is rectangular in outline with two flat, ground surfaces. The other two specimens are roughly oval in outline and appear to have been slightly shaped by pecking and grinding. One of these stones also exhibits heavy battering wear on two ends. Rubbing stones appear to be an unspecialized grinding implement used to pulverize seeds or other materials. The rubbing stones were recovered from the general fill of Features 6, 8, and 9B; those from Features 6 and 8 had the gray stain. The other specimen with a gray stain was from a general site provenience.

Metates. The two examples of full-trough metates were recovered from the general fill of Feature 8 and the pit structure floor. Both metates are complete and were manufactured from basalt. The grinding surfaces measure 34.0 by 31.0 cm and 41.2 by 39.0 cm. The depths of the troughs are 6.0 and 2.0 cm, respectively. The metates are slightly shaped by grinding and pecking.

Lapstones. Five pieces of basalt in varying forms and sizes represent unspecialized grinding stones, upon which seeds or materials were apparently ground or pulverized. The five stones are unmodified with irregular or slightly concave ground surfaces. Measurements of the ground surfaces range from 18.3 to 28.0 cm long and 13.3 to 22.0 cm wide. None of the specimens exhibit stains on the ground surface. Lapstones were recovered from the general fill (n=1) and the floor of Feature 9B (n=1). Another specimen was from the fill of the pit structure.

Indeterminate worked slabs. Thin tabular slabs of sandstone (n=4), crystalline tuff (n=4), and andesite (n=1) were shaped by spalling the edges into roughly rectangular outlines. The slabs were probably used for a variety of purposes. Three slabs were stacked together in the general fill of Feature 6. Measurements range from 33.5 to 41.2 cm, 24.0 to 32.2 cm, and 2.1 to 3.0 cm. Material types include sandstone, crystalline tuff, and andesite. The top stone was a sandstone slab with two finely ground surfaces. Both surfaces exhibit dark stains, and one surface has a slight polish. This specimen possibly represents a baking slab or comal, but the function of the other two slabs is unknown. Another sandstone slab from the floor fill of this room is a possible deflector slab for the ventilator. This slab measures 44.2 by 33.0 by 2.2 cm. A slab from the floor of Feature 9B measuring 46.0 by 30.0 by 5.1 cm apparently fit into the deflector slot in the pit structure and was thought to be the deflector. The slab was secondarily used as a lapstone and possibly scavenged from the structure. The remaining slabs from the general fill of various features may have been used as lapstones.

Axe. A single axe fragment was manufactured from a fine crystalline basalt and recovered from the floor fill of Feature 6. A pecked and ground groove is present on the fragment, and the axe surface is highly polished. Battering on both ends suggests the axe served as a hammerstone after the initial breakage.

Maul. A single maul manufactured from fine crystalline basalt is represented by three fragments recovered from three separate proveniences: the floor of Feature 8, the floor of

Feature 7, and a general site provenience. The presence of the maul fragments on the room floors suggests that the isolated Feature 7 was contemporaneous with the contiguous room unit. Fitting the pieces together forms a nearly complete tool. Unfortunately, it could not be determined from the fragment whether the pecked and ground stone was three-quarter or fully grooved. The surface is highly polished.

Polishing Stones. Two polishing stones were recovered from this site. One unaltered water-worn quartzite pebble has one smooth facet that appears to have been used for polishing. The artifact measures 3.5 by 3.0 by 1.7 cm and was recovered from the general fill of Feature 11. The other is a disk-shaped pebble of sandstone, which has been ground around its perimeter and exhibits polishing wear on two surfaces. Both surfaces have a dark gray stain of unknown origin. This specimen measures 4.7 by 4.5 by 2.0 cm and has a general site provenience.

Discussion. The ground stone assemblage from the site is typical of the food-processing equipment and curated artifacts (maul and axe) that might be expected at a residential site. The abundance of two-hand manos attests to the maize-oriented subsistence base. Although mealing bins indicate that Feature 6 functioned specifically as a food-processing area, other distinct activity areas were not delineated by the ground stone assemblage. It is possible that the roofs of the architectural features were used as activity areas, considering the number of complete artifacts in the general fill and the stack of worked slabs from the fill of Feature 8. In general, the ground stone distribution is homogeneous across the masonry rooms, jacal room, and pit structure.

Miscellaneous Artifacts

The only possible ornament recovered from LA 14858 was from the hearth fill in Feature 15. It was a small (75 by 61 by 18 mm) rectangular piece of soft white rock or mineral. The surface was completely modified into a tabular form, with a slight bevel along one edge. It may have been a blank for a bead or small pendant.

Faunal Remains

The sample of bone from LA 14858 is extremely small (Table 78). Only 56 elements were recovered from regular collection procedures and another 70 from three flotation samples taken from hearths. Poor preservation may have been a factor, because 73.2 percent of the bones collected with regular procedures are eroded or etched, and another 10.7 percent are burned (Table 79).

Cottontail rabbit (*Sylvilagus* sp.) and small mammal comprise nearly all of the burned bone. One jackrabbit (*Lepus* sp.) and a large mammal bone are also burned. Two less than mature specimens from a cottontail rabbit and six from a large squirrel (probably prairie dog) indicate warm-weather deposition at the site.

A single incidence of butchering was observed: chops and cut marks perpendicular to the axis of a large mammal long bone shaft fragment. The mountain sheep (*Ovis canadensis*) phalanx has an acid-like dissolving of the surface, possibly from digestive processes.

Bone Tools

Two awls were recovered. The first, from high in the fill of Feature 7, was complete. It was manufactured from a large mammal long bone shaft fragment and measures 13.8 cm long by 0.5 cm wide. The edges are slightly rounded, and the tip is highly polished. The second awl was from the fill of Feature 9. The butt end has a fresh break, and the remaining portion measures 14.8 cm long by 1.3 cm wide. There was no modification of the medium-sized artiodactyl metatarsal shaft splinter used for this awl. The tip is rounded and polished.

Flotation Summary

Flotation samples from Features 6 and 8 produced burned pine nuts, corncob fragments, and yucca and goosefoot seeds. Like most other artifact classes, vegetal material is sparse but reflects the full range of subsistence activities expected at a residential site (Toll and McBride, this volume).

Summary

LA 14858 is a small residential site consisting of a number of masonry rooms, a jacal structure, and a pit structure. Feature 6 was a specialized food-processing room. Much of its floor was occupied by three mealing bins and a hearth. The pit structure was shallow ,and its upper walls may have been jacal. There is some evidence that the pit structure was abandoned before the rooms.

The diversity of artifact types indicates the full range of activities expected of a residential site. Immature mammal remains suggest warm-weather deposition. Thus, the site appears to have been occupied by one or two families during at least the warmer seasons, and possibly year round.

LA 14882

LA 14882 is situated on a steep hillside about 75 m east of Largo Creek at an elevation of 2,214 m. Vegetation consists of piñon and juniper on the slopes and range grasses and yucca in the valley bottom. Exposure is west and southwest. Arable land can be found in the valley bottom immediately west of the site.

Cultural Remains

The site was recorded during the 1976 resurvey of the right-of-way (Kayser and Dart 1977:18 and appendix). A few sherds and a short cobble alignment suggested an eroded one- to two-room fieldhouse constructed of local cobbles and boulders.

Excavation Methods

An initial grid composed of five 2 by 8 m strips (Features 1 through 5) was established overlying the alignment. A sixth strip (Feature 6) was added, and Features 2 through 6 were extended (Fig. 71). Excavation proceeded as a series of stepped units of varying lengths because of the slope. Levels were designated in centimeters below ground level and ranged from 5 to 70 cm thick. Eventually, 10 cm levels below a site datum became the standard excavation level. Some levels within some strips were screened.

Fill generally consisted of rocky, sandy brown loam with occasional charcoal and artifacts. Upslope and 4.5 to 7.0 m north of Feature 8 (a possible room), charcoal and fire-cracked rock were observed. Downslope, the soil was darkly stained at 30 to 35 cm below the surface, presumably from dumping trash and living debris. Upslope from Feature 7 (another possible room), trash, charcoal, and burned rock were found down to 40 cm below the surface.

Feature Descriptions

Rock Alignments

Two rock alignments were located. The first was at the northeast end of Features 4 and 5, and the other was roughly 1.3 m south of the first in Features 5 and 6. These were called retaining or terrace walls, with no further description.

Feature 7

Feature 7 was a rectangular area, 1.82 by 1.65 m. A floor was defined 3.56 m below the site datum. Very poor ashlar cobble walls ranged in height from 20 to 80 cm due to the slope. The room was in extremely poor condition. No features were located, and no artifacts were assigned to the room.

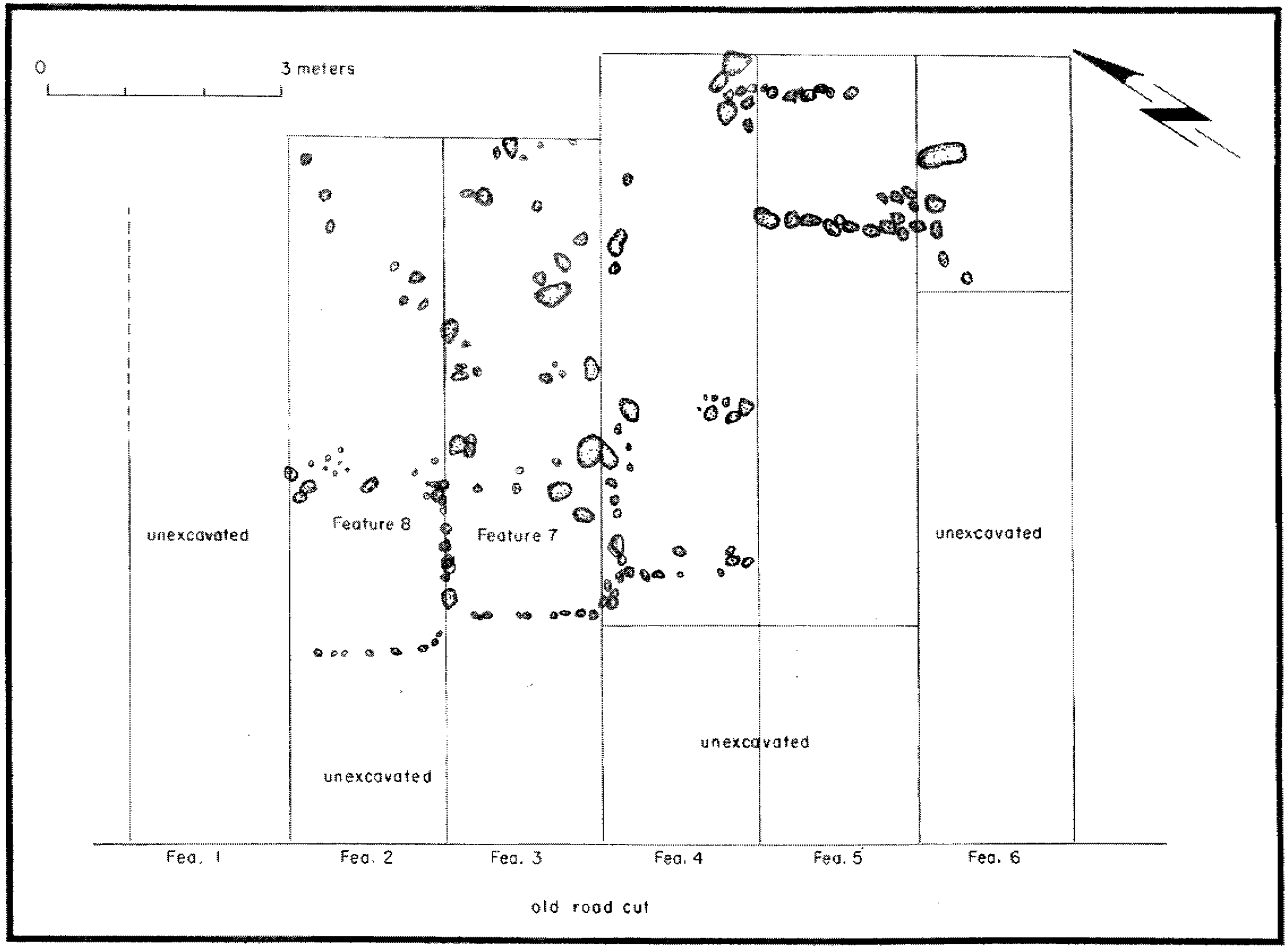

Figure 71. LA 14882 site map.

Feature 8

Feature 8 was also roughly rectangular, measuring 1.65 by 1.3 m. Its floor was 3.33 m below the site datum. It was in poor condition and had no features. Poor ashlar cobble walls were between 20 and 60 cm high. No artifacts were attributed to this room.

Cultural Materials

Ceramics

LA 14882 produced only 212 ceramics. Table 80 gives the totals and provenience distribution. Sherds from the grids comprising Features 7 and 8 are attributed to those features.

Reserve series wares make up the bulk of the assemblage--61.3 percent of the total. A few Tularosa Patterned Corrugated represent that series, and only one St. Johns Black-on-red was recovered. This combination suggests a mid to late A.D. 1100s date.

The Puerco Black-on-white sherd is the rim and neck portion of a pitcher. Reserve Plain Corrugated was of two varieties, one with wide, rather crude corrugations, and the other with narrower, better-formed coils. Sooted sherds from a number of types suggest food preparation at the site. No worked sherds were found.

Lithic Summary

Seventeen lithic artifacts were recovered: eight flakes, three angular debris, and six cores. No tools were found (Wening, this volume).

Ground Stone, by Charles A. Hannaford

The ground stone assemblage from this site consists of four artifacts. Material types include vesicular basalt (n=3) and fine-grained sandstone (n=1). All of the artifacts were recovered from nonfeature general site proveniences.

Manos. Two small one-hand manos, both complete, were found. Both manos were simply unaltered alluvial cobbles exhibiting unifacial faceting. The vesicular basalt mano measures 11.0 by 6.5 by 2.9 cm and has a rough grinding surface. The fine-grained sandstone mano measures 12.0 by 9.5 by 4.8 cm and has a very smooth grinding surface. Both grinding surfaces are flat, indicting use against a flat surface rather than a basin metate.

Metate. A single small vesicular basalt metate fragment is of an indeterminate type.

Grooved abrading stone. A small unaltered waterworn basalt pebble was utilized as a grooved abrading stone. Grooves on two opposing surfaces run the length of the stone. The stone measures 4.0 by 2.9 by 1.9 cm, and the grooves are 0.2 and 0.3 cm in diameter.

Discussion. Little can be said about the small ground stone assemblage. One-hand manos are generally associated with the processing of wild foodstuffs on basin metates. However, both ground surfaces are flat with striations, indicting linear use on a slab or trough metate. Wild-seed processing can be tentatively suggested. The contrasting textures (rough and smooth) may represent different stages in the grinding process.

The grooved abrading stone indicates the production of other tools or objects. The stone is an expedient grinding tool, since basalt occurs naturally on the site.

Summary

LA 14882 could represent an ephemeral one- to two-room fieldhouse or a more substantial site that has largely disappeared due to its location on a steep slope. Features and much of the trash could have washed down to the base of the slope, where they would have been truncated at the road cut.

LA 14906

LA 14906 is the farthest north of the Gallo project sites. It is situated on a low gravel terrace about 3 m above the valley floor at an elevation of 2,215 m. Largo Creek is 1.2 km to the west. Exposure is southwest, and there is a small rincon to the south. Vegetation is open piñon juniper woodlands.

Cultural Remains

This site was located during the 1976 resurvey of the right-of-way (Kayser and Dart 1977). A possible two- to four-room structure with a shallow depression suggestive of a pit structure and scattered refuse were recorded. Ceramic types observed include Alma Plain and the Reserve series (Kayser and Dart 1977:8).

Excavation revealed a site totally different from what was indicted by the survey. The cobble alignments thought to be rooms were not, and the primary features consisted of 21 or 22 firepits and four possible use-surfaces. Two San Pedro projectile points combined with Alma and Reserve series ceramics suggest sporadic use over a long period of time.

Excavation Methods

A base line running roughly east-west was laid out, and a series of 23 north-south strip zones were established to collect surface artifacts (Fig. 72). Eventually, the north-south zones were divided into 2 m units for better control.

Four backhoe trenches (Features 25-28) were placed around the site periphery. Feature 24 was excavated to a depth of 75 cm, Feature 26 to 37 cm, and Features 28 and 29 to depths of 40 cm. Site stratigraphy, recorded in Feature 24, consisted of four distinct layers. The upper layer, 20 to 25 cm thick, was brown sandy silts with almost no cultural material. It overlaid sandy silts that were darkly stained with charcoal but had little cultural material, extending to 36 cm below the surface. Between 36 and 54 to 60 cm below the surface was a layer of lightly stained sandy silt, some of which was laminated with pockets of darker soil. Cultural materials were found mainly in this layer. At the bottom was sterile off-white semiconsolidated cobbley soil.

Soils within the excavated portions of the site were described as brown sandy silt with various amounts of charcoal from the nearby hearths. The strata were compressed or different from Feature 24, because sterile was reached at 15 to 30 cm in Feature 5 at 28 m north. Fill at the north end of Feature 18 was described as two strata. Both are silts, but the upper one was root disturbed and did not have the "white specks" characteristic of the lower level. Firepits in the western part of the site tended to be very close to the modern ground surface. At the eastern end, in a series of circular tests, soils were brown to tan sandy silts (15 percent clay), with small amounts of pea-sized gravel. Artifacts tended to occur in the first 10 cm of fill (Table 81).

Features 100 to 106 were excavated four months after the original work in the grid system. The purpose was to see if surface remains reflect the subsurface artifact density. Since the main site had already been collected, the tests were placed east of the grid system. The test units were

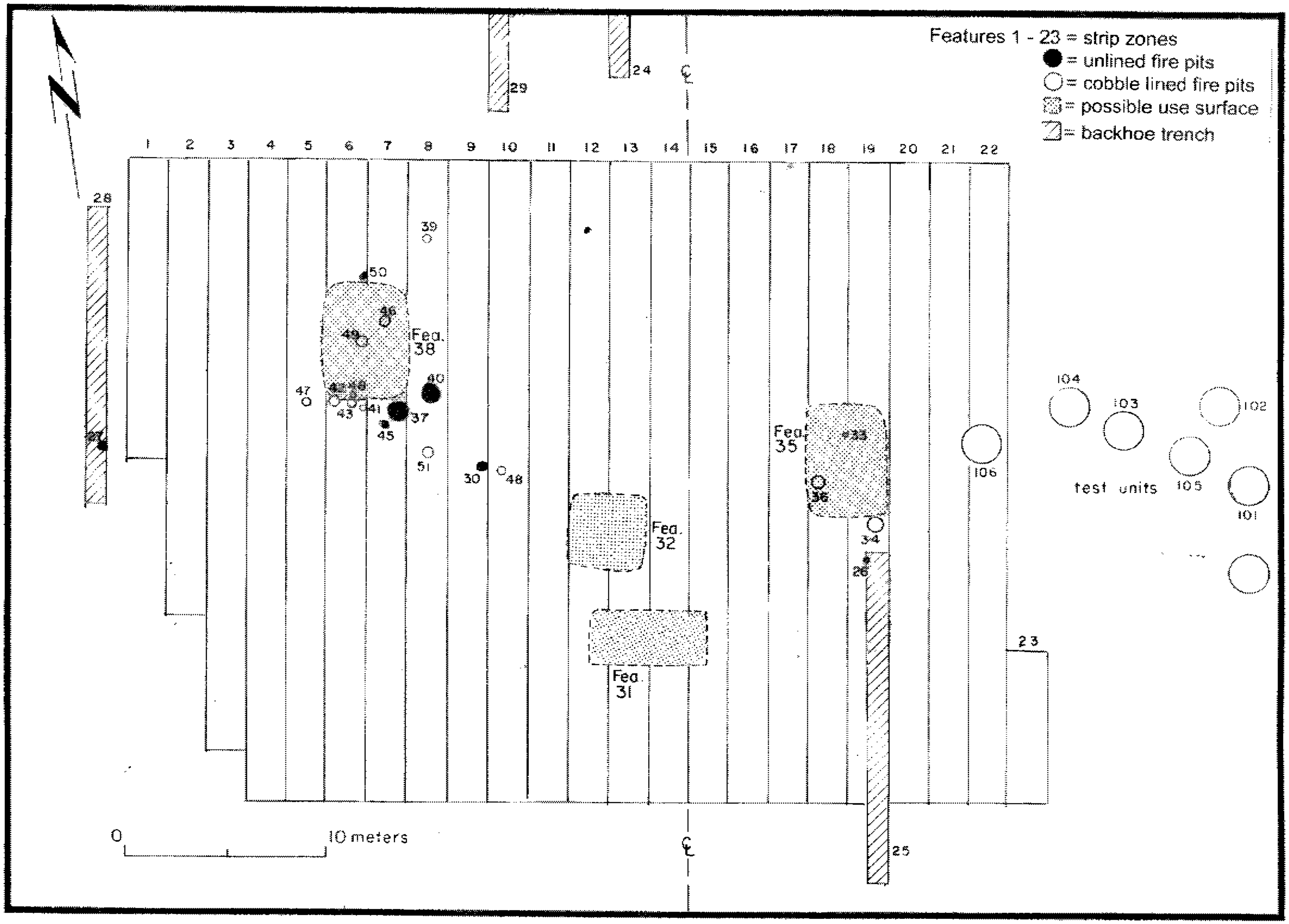

Figure 72. LA 14906 site map.

five circles, each 2 m in diameter. Four were within artifact clusters, while one test unit (Feature 105) had no artifacts on the surface. Unfortunately, artifacts were very sparse in this area, and at least two of the items used to chose the test locations were discarded in the lab as nonartifacts. This, combined with the location of the tests on the periphery of the site, makes any conclusions about relationships suspect. The locations of these tests is also uncertain. The second map tied the Features to the east-west base line but not the north-south one.

Feature Descriptions

Twenty-one firepits and fire-cracked-rock or stained areas were located. Table 82 gives the available information on each feature. None of these were drawn or profiled, and only two were photographed (Figs. 73 and 74).

There was considerable variability in the firepits which can be divided into four types. Small unlined firepits (Features 26, 27, 30, 45, 50, and 51) were the smallest, averaging 43 cm in diameter and 13 cm deep. Large unlined firepits (Features 37 and 40) average 1.07 m in diameter and 12 cm deep. Small firepits with rocks around part of the rim (Features 39, 43, 44, and 48) were only slightly larger than the small unlined firepits, averaging 45 cm in diameter and 8 cm deep. These were often no more than deflated ash stains with associated rock. Cobble-lined firepits (Features 34, 36, 42, 46, and 47) are the most variable, averaging 62 cm in diameter and 10 cm deep.

In addition to the firepits, four possible use-surfaces were defined (see Fig. 72). Feature 31 was in the area originally though to be a fieldhouse. A possible use-surface was located 5 to 10 cm below the surface. Other than size (3 by 6 m), no information was recorded concerning the surface.

Feature 32 was a hard-packed clayey surface approximately 4 by 4 m. Field notes mention a line of four postholes 50 cm apart just north and upslope of the surface. However, the feature was not mapped.

Feature 35, at the west edge of the site, was 6 by 4 m and 15 cm below the ground surface. It was light in color and of hard-packed clay. Undescribed Feature 33 and a firepit (Feature 36) are within the area delineated on a sketch map of the features. A tree was growing in the center of this surface.

Feature 38 was another 4 by 6 m area, 15 to 20 cm below ground surface. A possible use-surface was defined around a metate and a foot rest. Field notes describe a semicircular 1 by 2 m depression just south of Feature 49, but again, the feature was not mapped or described further. Feature 38 was in the greatest concentration of firepits, and at least four appear to be within its limits. Unfortunately, depths below surface were not recorded for the firepits, and associations are uncertain.

Soil samples were taken at 1 m intervals in Features 5, 11, 12, and 13 at depths of 10, 15, and 20 cm. The purpose of these samples was not revealed. They have been curated at the Museum of New Mexico.

Figure 73. Feature 37 partially excavated, LA 14907.

Figure 74. Deflated fire pit in Feature 106, LA 14906.

Cultural Material

Ceramics

Ceramics from this site were analyzed by Sandra Rayl. Her analysis differs from the previous one in that only rim sherds were assigned to Alma Plain, and body sherds are in the brown ware body sherd category. Rayl (n.d.) suggests that at least 10 vessels were represented and that sooting on the sherds in the vicinity of firepits indicate cooking in vessels at the site. Most of the assemblage consists of early wares, Alma Plain and San Francisco Red. A single red-on-brown sherd may suggest use during the San Francisco phase, A.D. 650-750 (LeBlanc and Whalen 1980:160).

Table 83 gives the ceramic distribution for this site. The site has been divided into eight groups based on the location of features and distribution of sherds. Sherds tended to be more numerous in the upper levels of fill, and there is some clustering around Features 35 and 38, suggesting these areas were utilized during the Early or Late Pithouse periods.

Four sherds, two Alma Plain and two San Francisco Red, were submitted for petrographic analysis. Temper from all four was sand plus volcanic rock fragments, similar to the temper found in two San Francisco Red sherds from LA 5407 (Garrett, this volume).

Lithic Summary

The amount of bifacial reduction in this assemblage suggests that the bulk of the lithic artifacts are associated with the Archaic component of the site. However, like the ceramics, the lithic artifacts cluster around Features 35 and 38 and may reflect a specialized use of the site rather than a temporal component.

The lithic assemblage consists of 718 flakes, 96 angular debris, 44 tools, 13 cores, 6 hammerstones, and 5 projectile points. Secondary and tertiary flakes outnumber primary flakes and angular debris. Rhyolite and chert/chalcedony are the most abundant material types. Tool types include shavers, knives, scrapers, and combination tools. Almost a quarter of the tools were associated with Features 35 and 38 (Wening, this volume).

Ground Stone, by Charles A. Hannaford

LA 14906 contained 23 ground stone artifacts. However, the majority of the assemblage (n=17) consisted of spherical concretions. The artifacts were constructed from quartzite (n=4), sandstone (n=1), and vesicular basalt (n=1). An indeterminate metate fragment from a hearth was the only artifact in association with a feature.

Manos. Five one-hand manos were collected from the site; four were fragmentary. These manos were merely unaltered alluvial cobbles. The only modification was the unifacial working surface produced by utilization. Oval cobbles of quartzite (n=4) and sandstone (n=1) were selected. The grinding surfaces exhibit very little alteration. Three of the working surfaces are smooth, and two are rough. Convex longitudinal and transverse cross sections indicate the manos were used on basin metates. The one complete sandstone mano measures 15.6 by 12.4 by 6.9 cm. This implement has been oxidized, and a portion fire-cracked.

Metate. A single indeterminate metate recovered from the general fill of a hearth was of vesicular basalt. The small perimeter fragment exhibits a slight concave grinding surface, but not enough to delineate a specific metate type.

Concretions. A total of 17 spherical sandstone concretions were recovered from the site. The stone balls range from 0.7 to 2.1 cm in diameter, all unaltered naturally round sandstone concretions. The exact function of these stones is unknown. Nor is it known whether these concretions outcrop in the immediate site vicinity.

Discussion. The small ground stone assemblage adds little to the discussion of this open campsite. The presence of one-hand manos suggests processing of seeds or nuts rather than corn. All of the grinding tools are very ephemeral, exhibiting little labor investment in their production. They appear to have been expediently selected, utilized, and discarded in the camp situation.

Miscellaneous Artifacts

An unaltered piece of weather-worn basalt has a painted or burned circular design with a dot in the center. The design element is black and measures 1.5 cm in diameter. The stone measures 7.5 by 4.0 by 1.5 cm.

A piece of a *Glycymeris* shell bracelet, reworked into a point on one end, was found in Feature 15 just below the surface. The reworked tip is highly polished, and the opposite end shows cuts partially through and perpendicular to the axis.

Also in the fill of Feature 15 was a piece of soft white mineral measuring 7 by 6 by 2 mm. It was completely modified into a flat rectangle, possibly for use as an ornament.

Faunal Remains

A total of 39 bones were recovered from at least eight animals of five species (Table 84). Two of these, pocket gopher (*Thomomys bottae*) and woodrat (*Neotoma* sp.), are probably post-occupational intrusives.

The small sample of bone is characteristic of a shallow, open activity site. There is some clustering of bone around the firepits and activity areas; however, this may be a function of more intensive excavation in these areas rather than the actual distribution. Only one specimen may have come from a firepit spot.

A large mammal long bone shaft fragment from the vicinity of Feature 37 has rounded edges and polish suggestive of use. Two specimens from Feature 9 are rounded, as if digested. The large artiodactyl element recovered from the surface, a phalanx, is heavily rodent gnawed and appears to be of recent origin.

Immature elements are abundant in the assemblage and represent cottontail rabbit (*Sylvilagus* sp.), pocket gopher, woodrat, and small to medium mammal. Burning is evenly split between small and large animals (small mammal, n=2; large mammal n=2).

Flotation Summary

As with fauna, macrobotanical material preserves poorly in shallow contexts. Economic plants represented in the four samples from firepits include burned juniper twigs as fuel and charred goosefoot seeds. No cultivars were found (Toll and McBride, this volume).

Summary

LA 14906 was a special-use site or campsite located away from Largo Creek and north of the main site cluster. The site appears to have used mainly during the Early Pithouse period, because the lithic artifacts, tools, and ceramics cluster around two use-surfaces. Archaic and Pueblo period use is also indicated.

The presence of ceramics and various tool types may suggest more than overnight stays at the site. The few plant processing tools, the location on a hill slope overlooking a small draw, and the amount of lithic reduction, especially biface reduction, suggests a hunting station used over a long period of time.

LA 14907 is on the top of a low rocky knoll below a ridge at an elevation of 2,216 m. It is on the south side of a large arable rincon that drains into Largo Creek, 500 m to the west.

Cultural Remains

The site was recorded during the 1976 survey of the right-of-way (Kayser and Dart 1977). Surface indications suggested a one-room structure and a depression, possibly a pithouse. Artifacts were sparse. Surface sherd types included Red Mesa Black-on-white and Alma Plain (1977:9).

Excavation uncovered two rooms, a work area, and a pit east of the structures. The structures are at the edge of the right-of-way and will not be affected by the road construction. Excavated parts were backfilled and covered with 15 to 20 cm of fill to protect the walls.

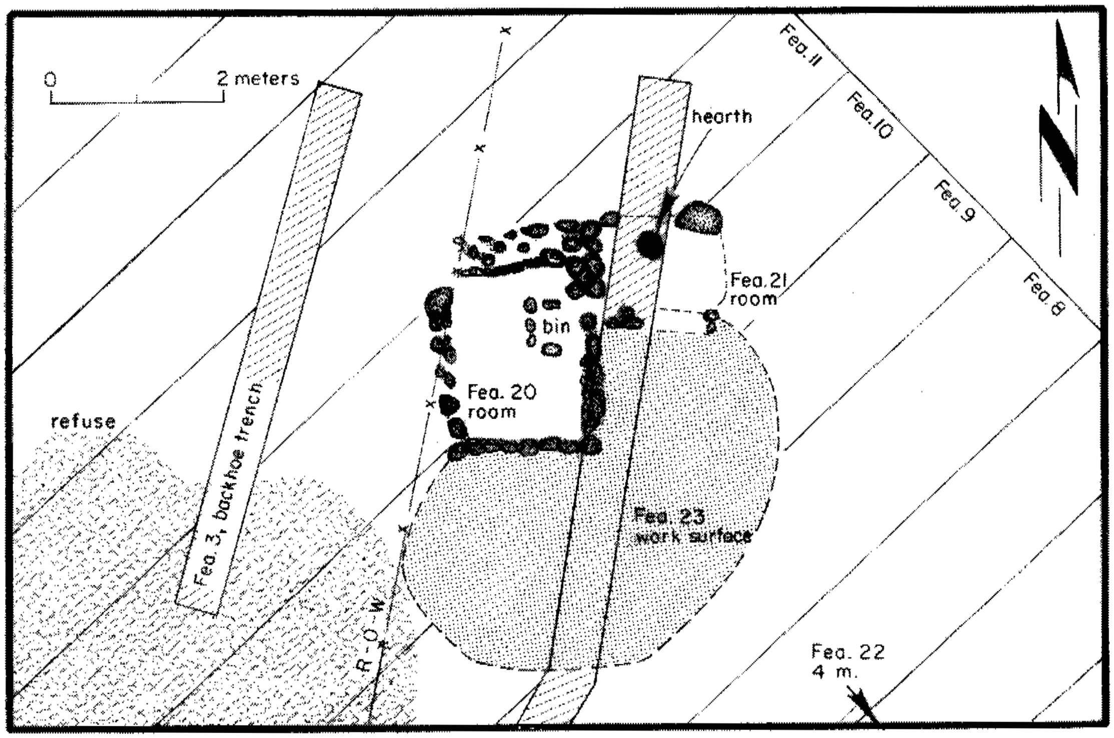

Figure 75. LA 14907 site map.

Excavation Methods

Work on the site began with three backhoe trenches. Feature 1 was located on the north-facing slope outside the main site area (Fig. 75). It was 11.5 m long by 0.75 cm wide and was excavated to a depth of 25 to 30 cm. No cultural material was observed. Fill was very rocky brown sandy clay.

Feature 2 was placed through the shallow depression thought to be a pit structure. It measured 21 by 0.75 m and was excavated to a depth of 25 to 30 cm. Again, the fill was a very rocky brown sandy clay, but charcoal was observed within the depressed area. The trench bisected the smaller room, Feature 21, and the work area, Feature 23. Small amounts of charcoal, a posthole, and stained soil were observed in the southern extension of the trench.

Feature 3, the western backhoe trench, measured 9.5 by 0.75 cm and was excavated to 25 or 35 cm below the surface. Fill was predominately rocky brown sandy clay with pockets of charcoal-stained soil. At the south end of the trench an off-white marley soil replaced the brown sandy clay. Underlying the brown layer was an orange-brown clayey soil.

After the initial trenching, a series of strip zones were established in an area 23 by 27 m (Features 4 through 17). Control was maintained within the strips with 2 m units measured south from the base line. Excavation was in 5 to 10 cm levels to depths of 5 to 25 cm. Which grids were excavated was not recorded. Presumably, not all grids were excavated, since no material was recovered south of 12 m south, a large area of which was designated a trash area. Screening was done "around the structures."

Feature Descriptions

The area of the two rooms and work surface was devoid of rock, unlike other parts of the site. Kayser (field notes) suggests that the three features were within a large barrow pit or that the area had been "mined" for wall rock.

Feature 20

The larger of the two rooms, Feature 20 (Fig. 76), had walls measuring 1.9 m on the north and south, 3.1 m to the east, and 2.7 m to the west. The surviving walls were a double course of ashlar cobble masonry with larger rocks toward the exterior and smaller ones to the interior. All were set in a clayey sand mortar. The maximum wall height observed was 43 cm in the west wall. A thin layer of clay plaster remained on the north wall.

Fill was extremely rocky from the fallen walls. Soil was clayey, with only traces of charcoal. The floor, 22 cm below ground surface, was very poorly defined. Numerous rocks projected through the surface. The floor consisted of clay placed over native cobbles after the walls were constructed.

The only feature was a rock-walled storage bin attached to the east wall. It measured 0.94 m on the north, 0.87 m on the south, 1.07 m on the east, and 1.05 m on the west. The walls were one cobble thick (20 to 30 cm).

Feature 21

A smaller room adjacent to Feature 20, Feature 21, measured 1.9 m on the north and south, 1.8 m on the east, and 1.4 m on the west. Walls were of cobble and mortar. The east wall and most of the north and south walls were almost or completely gone. The west wall had a maximum height of 28 cm and was 35 cm thick.

Figure 76. Feature 20, LA 14907, looking west.

The fill was the same as that throughout the site but with very small amounts of charcoal. The floor was 24 cm below the present ground surface and consisted of a thin layer of clay over small cobbles. A small hearth, 28 cm in diameter and 7 cm deep, was centered against the north wall. It was subrectangular, with a rock and packed-clay bottom. Fill was moderately charcoal-stained soil and ash. In the southwest corner was an area 50 by 35 cm formed by four to six cobbles, which may have been a mealing bin or a crude storage bin.

Feature 23

A work surface south of the rooms is suggested by the absence of rock and the hardness of the surface. It covers an area 7.0 by 5.7 m and was 10 to 15 cm below the modern ground level. The surface was a hard-packed brown clay, and the northeast perimeter was defined by 10 to 12 cobbles. A shallow depression, 28 by 49 cm and 4 cm below the use-surface, may have been a metate rest.

Feature 22

A rock-free area in Feature 4 measured 70 by 90 cm at 10 cm below the modern ground surface. Fill was typical of that at the site. The excavators felt Feature 22 suggested a burial pit, but no bone or cultural material was found.

Cultural Material

Ceramics

The 50 sherds recovered from LA 14907 were identified by Sandra Rayl. These are predominately from the Reserve series, and almost all represent jar forms. Sooting was noted on 40 percent of the brown wares, suggesting they functioned as cooking vessels.

The St. Johns Black-on-red sherd was worked. It was broken, and the edges were lightly ground. Table 85 gives the distribution of wares by provenience. The assemblage suggests deposition prior to A.D. 1150 and continuing through at least A.D. 1170.

Lithic Summary

Seventeen flakes, one angular debris, three cores, a chalcedony scraper, and two basalt tools comprise the lithic assemblage (Wening, this volume). No ground stone was recovered.

Faunal Remains

The few bones recovered from LA 14907 are from large-bodied animals (Table 86). This probably results from a combination of poor preservation, paucity of cultural material at the site, and poor collection procedures. All of the bone recovered is either burned or weathered (checked, exfoliated, or eroded) and recovered from no more than 15 cm below the surface.

A least two animals are represented, a white-tailed deer (*Odocoileus virginianus*) and a larger artiodactyl. The elements are both foot parts--a mostly complete phalanx and a tarsal fragment. The latter was burned.

Flotation Summary

Neither of the flotation samples from this site produced cultural remains. Poor preservation is probably a factor (Toll and McBride, this volume).

Summary

LA 14907 was probably a small, seasonally occupied field structure dating to the mid A.D. 1100s. Fill was shallow, and little cultural material was recovered. However, a substantial area of refuse was not tested except by a backhoe, and the dirt was unscreened.

LA 14908 is located on the basal portion of a steep hill 90 km east of Largo Creek at an elevation of 2,223 m. Exposure is to the west, and vegetation is piñon and juniper with narrowleaf yucca and grasslands in the valley bottom (Fig. 77).

Figure 77. Overview of LA 14908.

Cultural Remains

This site was recorded during the 1976 survey (Kayser and Dart 1977). No architecture was evident, but refuse was visible at the base of the hill and on the adjacent valley floor. The top of the hill was severely eroded, and no cultural material was observed beyond 3 m up the slope. Ceramic types observed were from the Reserve series and Tularosa Patterned Corrugated (Kayser and Dart 1977:10-11).

Excavation Methods

A base line parallel to the slope at 40 degrees west of north and a series of strip zones 12 m long and 2 m wide were established over the area. Additional zones were added and others enlarged during the course of excavation. Control within the zones was by 2 m units measured in meters east of the base line (Table 87).

Fill was fairly uniform throughout. The upper 5 cm was loose eolian sand with grass and rock in the upslope area. Lower levels were water-laid deposits. Downslope, the upper 5 to 10 cm of fill was light tan-brown silt with gravel and hard clay around the rocks. From 10 to 30 cm was a hard gray-brown sandy, silty soil mixed with clay. A hard, cracked, water-washed layer between 10 and 20 cm below surface was found throughout the site area. Below 30 cm was a gray-purple-brown rocky sand with some clay content. Portions of several grids were removed by a bulldozer, which churned up the top 15 to 20 cm of soil.

A number of possible rock alignments were noted. In Feature 6, at 9.0 and 11.5 m east, stacks of rock three courses high but with no mortar were observed. They may be terrace walls. The field journal mentions three room outlines in Features 23 to 29, but these are not discussed further, and presumably they are not walls. The best evidence for a structure was in Features 15 through 18--a concentration of rock, wall plaster, and trash. No walls were located in Features 15 or 16, and Features 17 and 18 were not excavated. A possible fallen wall running north to south at 12 m east in Features 14 and 15 was noted.

In summary, extensive surface stripping and excavation failed to locate intact walls. The slope may have caused the walls to fall, and floors may have been completely destroyed. A large number of sherds were recovered, suggesting more than a couple of rooms. It is also possible that the rooms are or were upslope from the excavations and deeply buried or washed away. The top of the ridge, 12 m beyond the excavations, was described as heavily water damaged. No trash was observed.

A pollen column was taken from the bank of Largo Creek west of the centerline. Two areas 4.5 m apart were selected and faced off to 3.0 m below the current ground level. A vegetative inventory was made, pollen samples were taken every 10 cm, and the strata were described in detail. The time range includes Pleistocene gravel to recent surface deposits. Charcoal, present at just over 1 m below ground surface, was probably washed from the nearby Pueblo period sites. The samples were not analyzed for this project and were curated at the Museum of New Mexico.

Cultural Material

Ceramics

LA 14908 produced a fair sample of ceramics, 1318 sherds. The Reserve series dominates the assemblage at 51.1 percent. The Tularosa series comprises 9.8 percent, and indented white ware only 1.1 percent. Relatively few painted wares were found, and jar sherds far outnumber bowl sherds. Table 88 summarizes rim form by ware and suggests that a fairly large number of vessels is represented by the assemblage. Plain brown ware and Tularosa Patterned Corrugated, Smudged, have the most diversity in rim form. Direct rim forms outnumber everted ones.

Tables 89 through 91 give information on surface stripping, excavation, and sherd frequencies. Because the site is a midden, grids have been liberally combined for presentation. The major concentration of sherds was in Features 14 to 16, which contain half of the sherds. This concentration was in the upper level of fill, and frequencies decrease steadily with depth. There does not appear to be any stratification. Possible early wares occur from top to bottom, as do later wares such as Tularosa Black-on-white. The absence of St. Johns Black-on-red in such a large sample suggests the deposition ended prior to A.D. 1100.

Lithic Summary

Lithic artifacts recovered from LA 14908 include 179 flakes, 38 angular debris, 49 tools, 10 cores, a hammerstone, and 2 projectile points. Rhyolite is the most common material type for debitage and cores. Tool types include shavers, knives, scrapers, a drill, a hoe, combination, and indeterminate tools. Lithic artifacts are mainly from Features 14 through 16 and in the upper levels of fill (Wening, this volume).

Ground Stone, by Charles A. Hannaford

The ground stone assemblage from LA 14908 consists of a single basalt one-hand mano and three spherical sandstone concretions. All of the artifacts were recovered from nonfeature proveniences.

Mano. The one-hand mano fragment is characterized by a circular outline and a unifacial grinding surface. This waterworn basalt cobble shows no evidence of shaping, and the grinding surface is smooth and very slight. Longitudinal and transverse cross sections are convex, suggesting use on a basin metate.

Concretions. Three unaltered sandstone concretions measure 1.0, 2.2, and 2.6 cm in diameter. The exact function of these "stone balls" is uncertain.

Discussion. Little can be said of the ground stone assemblage other than the indication of limited wild-seed processing suggested by the one-hand mano.

Faunal Remains

Like the ground stone, and unlike the ceramics, bone was sparse at LA 14908 (Table 92). This small sample was not expected, given the large number of sherds and the site's description as a trash area. Those that were recovered were scattered throughout the gridded area. Only one grid producing more than a single element. Over half the assemblage came from less than 10 cm below the surface (n=6). One is from between 10 and 30 cm below the surface, and the remainder (n=3) are from 35 to 60 cm deep. Poor preservation may be a factor, but the recovery of smaller animal bones suggests it was not the only one.

At least four species are represented, one of which is probably a postoccupational burrower (*Thomomys bottae*, pocket gopher). The element distribution indicates no more than one individual of each taxon. Hawk (*Buteo* sp.) elements are rare in the Gallo project collections.

Summary

LA 14908 represents downslope trash and, possibly, rooms that have been totally destroyed by slope wash. A large number of sherds were recovered. Lithic artifacts and bone were present, but few were collected. The most unusual aspect of the artifact assemblage is the virtual absence of ground stone. The artifact frequencies are difficult to explain except as extremely poor collection of all artifact groups except ceramics.

LA 14909

LA 14909 is at the base of a hill, 150 m east of Largo Creek. The upper slopes are heavily eroded, and exposure is to the southwest, toward the creek. A large rincon lies to the west across Largo Creek, providing a large area of potentially arable land. The elevation is 2,225 m. Vegetation is piñon and juniper on ridge slopes and range grasses in the valley.

Cultural Remains

This site was recorded during the 1976 survey of the right-of-way (Kayser and Dart 1977). No architecture was visible. However, surface brown wares and lithic artifacts suggested a one- or two-room hillside structure (Kayser and Dart 1977:11). Subsequent excavation uncovered four rooms, possible work areas, and a possible encircling wall.

Excavation Methods

A base line and six 2.0 by 8.0 m strips were established at the base and part way up the slope (Fig. 78). Features 2 to 4 were surface stripped, then trenches were used to locate the structures (Fig. 79). Excavation generally proceeded in 2 by 2 m units excavated in 10 cm levels below the site datum. Unfortunately, ground surface depths were not recorded, and the datum was not located on the site map. Fill from the test trenches and Features 7 and 17 was not screened.

Upper fill in the strip trenches was grass and rock in a sandy, gravelly soil. Below this was approximately 70 cm of trash and cobbles from wall fall. The 1 m wide trenches indicated on the map were excavated down to sterile.

Feature Descriptions

Features 8 and 9

Features 8 and 9 were a single large room (Feature 8/9), which was later subdivided (Fig. 80). Walls of Feature 8/9 were cobble ashlar. Larger rocks were supported by flat chinking stones, and mortar was applied in thick bands. Walls across the slope were badly disturbed by downslope earth movement, but those cut into the slope were in fair condition. Traces of dark gray wall plaster were found in both rooms. Wall height was greatest to the north (1.09 m) and least to the west (0.3 m). Wall thickness varied between 20 and 28 cm. The combined room size was approximately 2.25 by 4.6 m (an area of 10.3 sq m).

The floor of Feature 8/9, at 67 to 68 cm below datum, was severely eroded in both rooms. That within Feature 9 appeared to be a prepared mixture of gravels and clay. Within Feature 8 (Figs. 80 and 81), and associated with the floor, was a 15 cm diameter posthole (Hole 1) that was partially rock lined and filled with gravelly, lightly organic fill. In Feature 9 (Figs. 80 and 82), two postholes were in the northeast and southeast quads, along with and a storage pit filled with trash and a cream-colored powdery material. None of the features were measured.

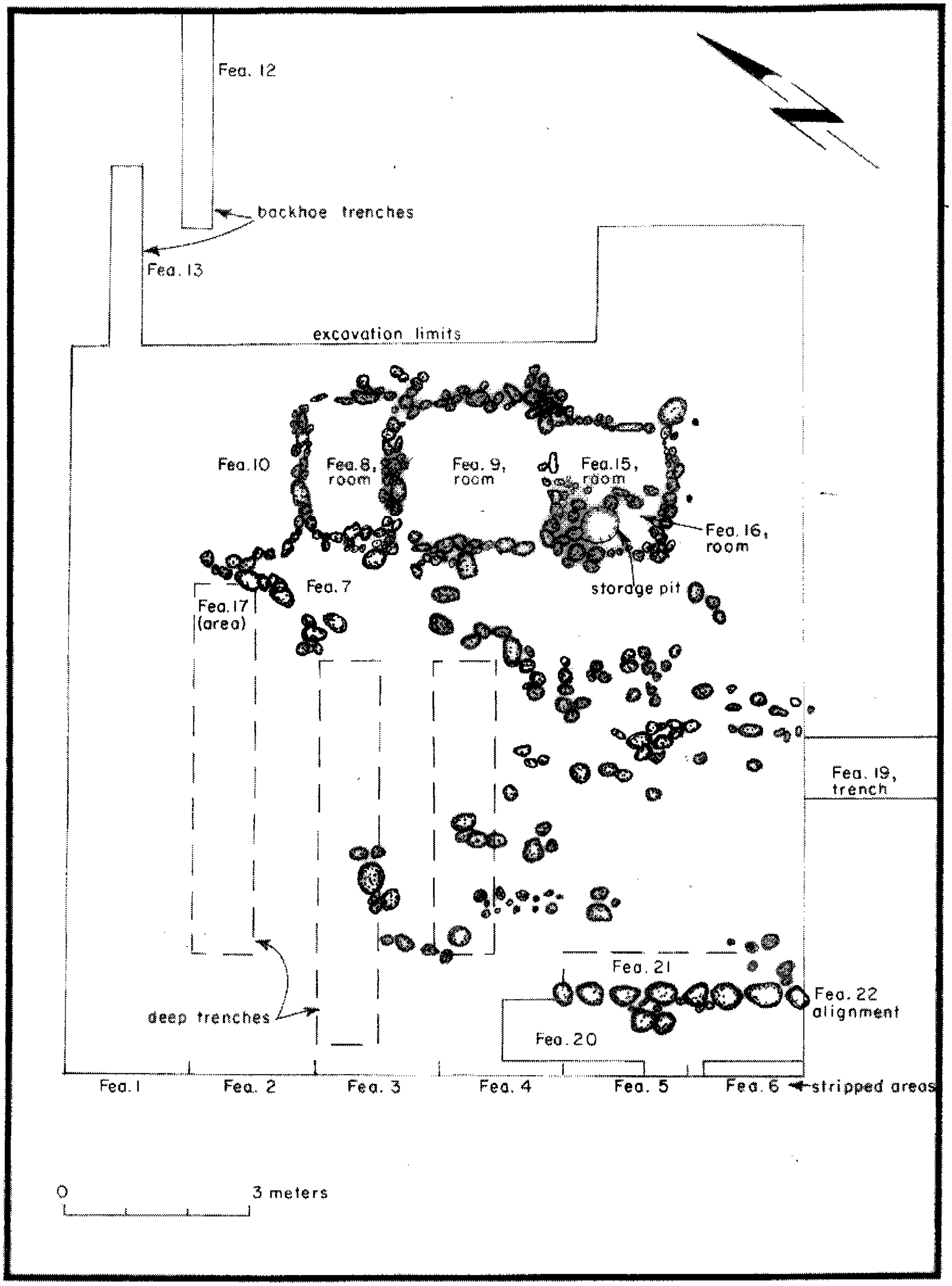

Figure 78. LA 14909 site map.

Figure 79. Deep tests, LA 14909, looking northeast.

Twenty centimeters below the lower floor in Feature 9 (90 cm below datum) and partially under the storage pit was a hearth (Feature 14) associated with an earlier structure or use-area. It was a circular basin-shaped pit 40 cm in diameter and 21.5 cm deep. It was partially rock lined, and the fill was white-gray ash. There is no indication in the field notes that a surface or other features are associated with this lower occupation. The southwestern quarter of the room was excavated below the floor level. The fill was described as rocky, gravelly yellowish soil with sand and a high organic content. It was described as sterile; however, lithic artifacts were recovered from the level.

The dividing wall was thicker and cruder than the original room walls. It is unclear if Feature 8 continued to be used at the original floor level or was abandoned after the cross wall was built. The later is suggested by the ceramic assemblage. A fairly large number of indented white ware sherds were found in Feature 8, but none were found in the fill above the upper floor in Feature 9.

After division, Feature 8 wall lengths were 2.15 m on the north, 2.06 on the south, 1.38 m on the east, and 1.42 m on the west wall (an area of 4.96 sq m). Fill within Feature 8 was large rocks in brown, sandy, gravelly soil that had some charcoal and ash. The upper fill of Feature 9 was similar down to 50 cm below datum, where it changed to a lighter-color soil with finer particles.

The floor of Feature 9 was unprepared. At 57.5 cm below datum, it existed mainly around the single room feature, a hearth. The hearth, Feature 11, was more or less central but 40 cm closer to the south wall than the north. It was an unlined basin 43 to 55 cm in diameter and 10 cm deep. Fill was fine ash with some charcoal and a few fire-cracked rocks.

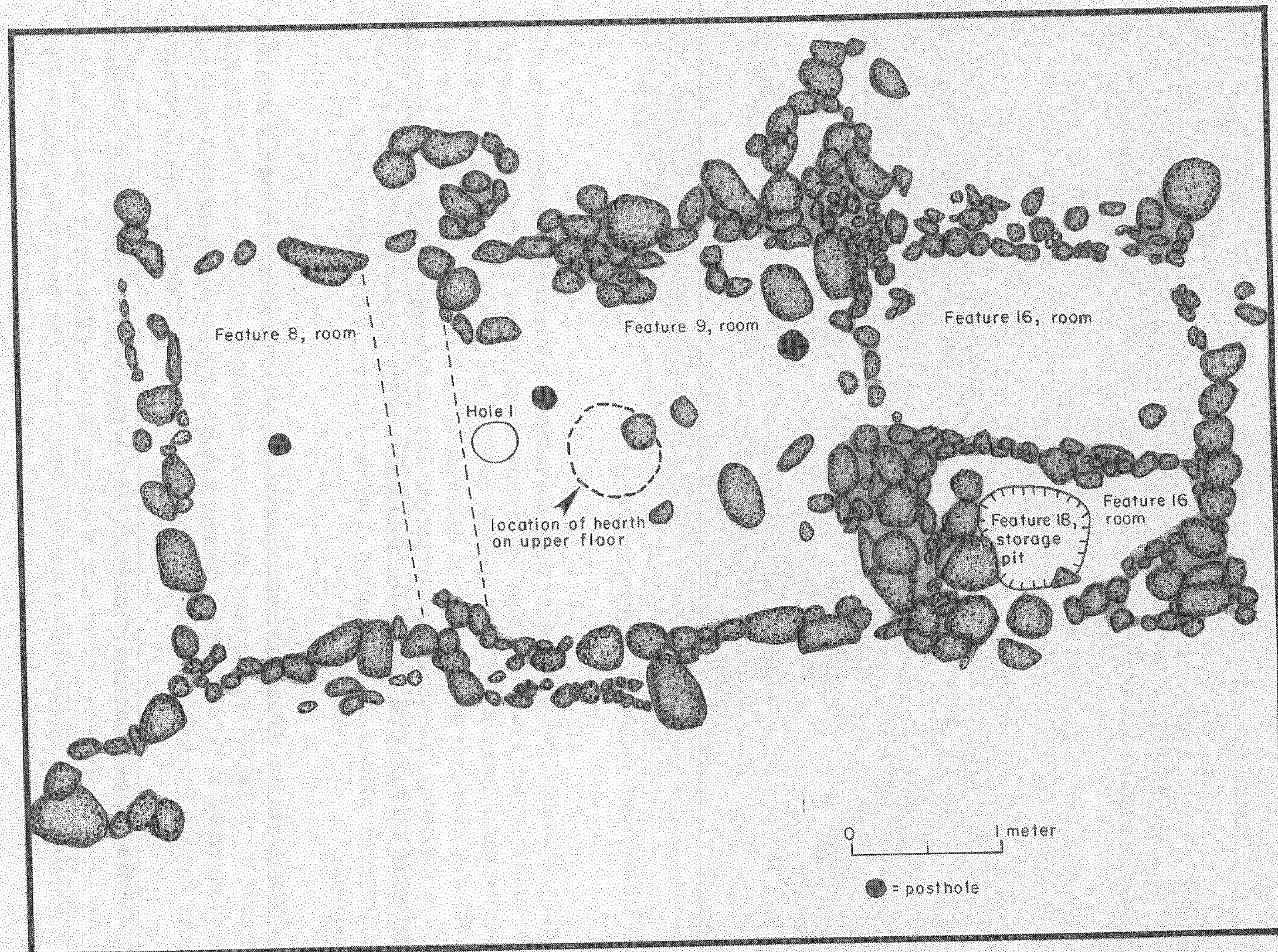

Figure 80. Features 8, 9, 15, 16, and 18, LA 14909.

Figure 81. Feature 8, LA 14909, looking northeast.

Figure 82. Feature 9, LA 14909, looking northeast.

Feature 7

A work area just west of and in front of Features 8 and 9 measured 3.1 m north to south and 1.6 to 2.0 m east to west. A use-surface was located between 0.9 and 1.10 m below datum. Fill was gravelly sandy brown loam with charcoal, ash, wall fall, and a few fire-cracked rocks. A concentration of ash and charcoal found between 0.9 and 1.0 m below datum was probably the remains of a hearth.

Feature 17

Downslope from Feature 10 was another work area delimited by a crude rock and boulder alignment. The area was 3.7 m north to south and 2.3 m east to west, with the use-surface at 1.68 m below datum. Fill was brown gravelly sandy loam with some fire-cracked rock and charcoal throughout.

Feature 22

This large basaltic boulder alignment was about 7.0 m downslope from the rooms. The rocks were interpreted as a single-course encircling wall.

Trash Area

Trash was thrown downslope from the rooms. The upper 30 to 35 cm of fill was dark gray forest humus with large and small rocks. Considerable amounts of charcoal and charred organic material were found in the upper fill. The extent of the trash was not recorded and can only be inferred from the artifact distribution. Beneath the trash was a light gray volcanic soil.

Test Trenches

Features 12 and 13 were placed upslope from Feature 10 to determine the source of charcoal in that feature. Fill was very rocky, gravelly, sandy brown loam. No cultural material was recovered.

Feature 19 was excavated to ascertain whether there were structures downslope. None were found. The upper 50 cm of fill consisted of hand-sized cobbles mixed with gravel and tan to brown soil with a high volcanic ash content. Rock decreased below 0.5 m, and fill at 0.85 to 1.0 m was a mixture of soft sand with hard white volcanic ash and light purplish gray clay. Charcoal bits were sparsely scattered throughout.

Features 20 and 21 were excavated on either side of the boulder alignment, Feature 22. These were 3.5 and 4.0 m long. Fill was light brown sandy, gravelly soil with charcoal bits.

Cultural Material

Ceramics

LA 14909 produced 915 sherds (Tables 93-95). Unidentified brown ware and brown ware, smudged (42.2 percent), and the Reserve series (44.6 percent) comprise most of the assemblage.

Wares predating A.D. 1050 are rare, as are those in the Tularosa series (2.6 percent), suggesting a fairly short occupation during the A.D. 1000s and early 1100s.

The concentration of indented white ware (half those recovered from the site) in the fill of Feature 8 and the overall distribution of wares between Features 8 and 9 suggest different fill histories (Table 94). The lower floor (Feature 8/9) assemblage has wares in common with both rooms but is more similar to that of Feature 8. Feature 8/9 and Feature 8 have seven wares in common compared to only three for Feature 8/9 and Feature 9, and two for Feature 8 and Feature 9. This combination suggests that Feature 8 was abandoned and Feature 9 continued to be used after the room was divided.

A number of worked sherds were recovered (Table 96). These include possible scrapers, discs, and bowl sherds with mend holes.

Six sherds were submitted for petrographic analysis, two indented white wares, and four Reserve Plain Corrugated sherds with corrugations of various widths. Temper in the former was metamorphic rock fragments, and that in the Reserve Plain Corrugated was crushed andesite or sand and volcanic rock fragments (Garrett, this volume).

Lithic Summary

Lithic artifacts collected from LA 14909 include 89 flakes--mainly secondary flakes, 11 angular debris, 14 tools, 3 cores, and 4 projectile points. The tool assemblage is dominated by scraping and chopping tools used mainly for plant processing. Scrapers are the most common tool type (n=6), followed by indeterminate tools, one shaver, one knife, one notched scraper, and one chopper. Lithic artifacts were most frequently encountered in the trash areas (64 percent) and exterior work area (17 percent) (Wening, this volume).

Ground Stone, by Charles A. Hannaford

A total of eight ground stone artifacts and three choppers were recovered from LA 14909. The artifacts were constructed from vesicular basalt (n=5), basalt (n=3), sandstone (n=2), and rhyolite (n=1).

Manos. Two complete one-hand manos were constructed of unaltered waterworn cobbles of sandstone and vesicular basalt. Both complete specimens are roughly circular in outline with unifacial grinding surfaces. The sandstone mano has two smooth grinding facets and measures 15.2 by 10.9 by 4.0 cm. The vesicular basalt mano has a rough grinding surface exhibiting little evidence of use. It measures 15.0 by 10.8 by 6.8 cm. Convex longitudinal cross sections and striations perpendicular to the long axis of the stones seem to indicate a linear grinding motion on basalt metates. The manos have nonfeature proveniences.

Two complete two-hand manos are roughly rectangular in outline with rounded corners. The manos are constructed from slabs of vesicular basalt and range in length from 16.8 to 19.5 cm, in width from 11.1 to 14.9 cm, and in thickness from 3.0 to 4.0 cm. Both manos have unifacial grinding surfaces, and one specimen has two facets on the grinding surface. The backs of both manos are unaltered. One mano has a flat longitudinal cross section and lacks end polishing, suggesting use on a slab metate. The other mano also lacks end polishing but has a convex longitudinal cross section, so that use on a specific metate type cannot be assigned. The working surfaces on both manos are rough. Both have nonfeature proveniences.

Metates. A single trough metate fragment was constructed from an unshaped piece of vesicular basalt. An open or closed trough could not be distinguished from the fragment. The width of the trough is 21.0 cm; the depth 3.0 cm. The metate has a nonfeature provenience.

Lapstones. Two unaltered pieces of waterworn basalt were assigned to this category. The lower face or "bottom" of the specimens are unmodified. The grinding surfaces of both implements exhibit only slight use by a linear grinding technique. The working surfaces are rough and probably represent expedient base stones upon which seeds or other materials were ground. Pigment stains were absent from both specimens. The stones measure 22.0 by 14.8 by 8.6 cm and 21.0 by 24.0 by 10.2 cm. The latter stone was recovered from the general fill of Feature 16.

Grooved abrading stone. An unaltered cobble of waterworn basalt with a natural groove was probably utilized as an expedient grooved abrading stone. The groove shows only slight evidence of wear. The stone measures 12.5 by 9.8 by 7.6 cm. The groove is 9.8 cm long and 2.5 cm in diameter. It is from a nonfeature provenience.

Choppers. This category consists of three unhafted cutting tools constructed from pieces of rhyolite, basalt, and sandstone. The dimensions range from 13.0 to 21.0 cm long, 6.4 to 11.8 cm wide, and 4.1 to 7.5 cm thick. Marginal chipping has produced a cutting edge along one lateral edge. Battering wear and rounded working edges indicate the choppers were designed to cut with repeated blows. The tools are unaltered with the exception of the cutting edge and represent an expedient class of chopping tools.

Discussion. The small ground stone assemblage from the site is primarily composed of specialized and unspecialized grinding implements. Maize and wild-seed processing are indicted by the few examples of one-hand and two-hand manos. The presence of lapstones and the grooved abrading stone suggest production of other tools or objects. Since the majority of the artifacts have nonfeature proveniences, the ground stone assemblage adds little to the discussion of functional variation between the architectural features.

Faunal Remains

Considering the amount of trash removed from this site, the bone assemblage is extremely small (n=55) (Table 97). The proportion of weathered bone is high (43.7 percent), yet over half the sample is from very small animals. Very few burned bones were recovered (5.4 percent; two cottontail rabbit and two jackrabbit bones), suggesting that collection procedures had an effect on the sample collected.

Jackrabbit (*Lepus* sp.) is the best-represented species in terms of numbers and distribution, although almost half of those recovered are from what appears to be one articulated foot found in the fill of Feature 9. Almost a quarter (23 percent) of the jackrabbit bones are from young animals (three immature and two young adult), suggesting at least some late spring to fall deposition. Specimens from less than full-grown individuals were also found for the small squirrel taxon (sciurid), prairie dog (*Cynomys gunnisoni*), pocket gopher (*Thomomys*), and banner-tailed kangaroo rat (*Dipodomys spectabilis*).

For such a small sample, there is an unusual array of species. This is the only Gallo site in which both species of deer are represented by bulk bone. Similarly, turkey (*Meleagris gallopavo*), prairie dog, and squirrel remains are rare in the Gallo assemblages.

Artiodactyl parts are all from feet or lower legs. Turkey is represented by a partial ischium and a humerus. No egg shell was collected.

Bone Tools

A portion of a bone tool was recovered from Feature 4. It is made from half of the distal end of a mule deer (*Odocoileus hemionus*) metapodial. The tool has grinding on the medial surface and small cuts just above the condyle, probably from butchering. It is broken just above the condyle but probably was the butt end of an awl.

Flotation Summary

Although a limited number of samples was collected and analyzed, this site produced burned goosefoot and corn cobs. A variety of woods suggest different utilization for fuel and architectural elements (Toll and McBride, this volume).

Summary

LA 14909 was a small two- to four-room hillside structure, probably occupied in the late A.D. 1000s to mid 1100s. Like LA 14908, ground stone was very poorly represented in the artifact assemblage, and there was no evidence of mealing bins, yet corncobs were found. A good sample of ceramics was recovered, but few bones were recovered. Those found represent a diversity of taxa. It is hard not to conclude that artifact recovery was poor and not representative of the activities at the site.

LA 14910

LA 14910 is on the valley floor at the base of a hill and at the confluence of two small arroyos (Fig. 83). It is 90 m east of Largo Creek. Exposure is west-southwest, and the elevation is 2,233 m. Vegetation consists of piñon and juniper on the hillsides and grasslands in the valley.

Cultural Remains

LA 14910 was discovered during the 1976 right-of-way survey. A 2 m long boulder alignment (Fig. 84) was recorded as an agricultural feature of a possible fieldhouse (Kayser and Dart 1977:12). Excavation revealed a possible jacal structure, a use-surface, and the boulder alignment. Very little cultural material was recovered, suggesting an occasional use-area associated with tending fields.

Excavation Methods and Feature Descriptions

Six 2 by 12 m strip zones (Features 1 through 6) were established and surface-collected. Features 1 through 5 were surface-stripped in a 5 cm level. Subsequent excavation was in 10 cm levels, and control was by 2 m units measured from the base line. The upper soil was water- and wind-deposited sandy silt with few rocks or gravel. Four deep tests in Feature 5 were excavated down to 50 cm. Fill from 5 to 45 cm was dark gray to brown-tan soils, and that from 45 to 55 cm was sterile off-white volcanic soil.

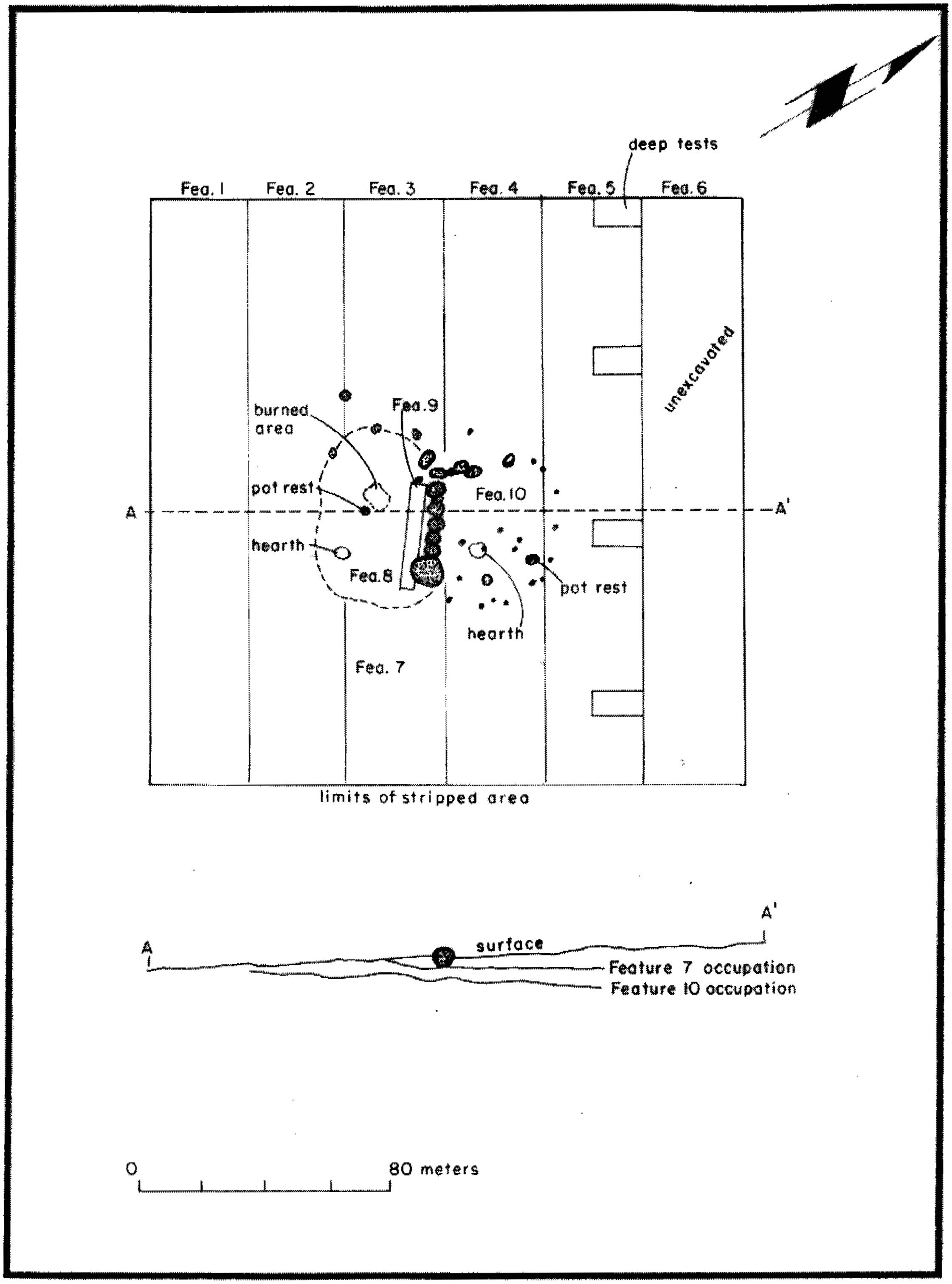

Figure 84. LA 14910 site map.

The cobble alignment (Feature 7) consisted of large (30 to 40 cm) and medium (20 to 25 cm) cobbles. The largest rock forming the southeast corner weighed 137 kg. Six to nine other rocks completed the wall, which measured approximately 2.48 m. The standing height of the wall was 45 cm, and the excavators suggest it may have stood as tall as 1 m. Soils around the alignment were hard dry clayey silts with thin water-laid layers of clayey silts. No definite floor was found; however, north of the alignment at 12 to 15 cm below the surface was a possible hard-packed surface at the base of the wall. The size of the surface was not recorded.

North and east of the alignment, at 35 cm below the ground surface, was a circular unprepared hard clay surface with 17 associated postholes (Feature 10). This jacal or brush wall enclosure measured 3.0 by 3.5 m (an area of 10.5 sq m). Fill was lenses of hard laminated clay. Numerous rodent and root holes made identification of cultural features difficult. The postholes ranged from 7 to 17 cm in diameter (mean 11.4 cm, standard deviation 2.9) and from 4 to 13 cm deep. Thirteen postholes formed the perimeter wall, the other four were between the hearth and the east wall. Inside the enclosure was a hearth, 40 cm in diameter and 8 cm deep, and a pot rest, 24 cm in diameter and 6 cm deep.

South and west of the alignment was Feature 8, a fire-reddened hard clay surface measuring 2.0 by 3.5 m (an area of 7.0 sq m) at 25 cm below ground surface and 10 cm below the base of the cobble alignment. The surface was hard-packed clay with a 50 cm diameter burned area, a shallow basin hearth (30 cm in diameter and 5.5 cm deep), and a pot rest (14.5 cm in diameter and 2 cm deep).

Features 8 and 10 are probably contemporaneous, and the rock alignment and associated surface are slightly later. Soils comprised of layers of wind- and water-laid soils suggest rapid deposition and repeated flooding of the area.

Cultural Material

Artifacts were recovered in 10 cm levels by grid. Apparently nothing was found within Features 7 and 10. All cultural material was from within 20 cm of the surface.

Ceramics

Twenty-six sherds were recovered from LA 14910 (Table 98). None were decorated, and two Reserved Smudged vessels may be the only bowls represented. Rim sherds document a single Alma Plain vessel with a flattened rim, a Reserved Corrugated, Smudged jar with a direct rounded rim, and two Reserves Smudged bowls suggested by a direct tapered rim and a direct rounded rim sherds.

No sherds were recovered from the jacal or use-surface. The overall distribution suggests a fairly light and uniform scatter. The largest sample from one unit was four sherds from an area measuring 4 m sq.

Lithic Summary

Lithic artifacts were equally sparse. Two flakes, two cores, two tools, and an unmodified cobble comprised the lithic assemblage (Wening, this volume). No ground stone was recovered.

Summary

LA 14910 is a possible fieldhouse site opposite a good-sized rincon. The paucity of features and cultural material suggest a day-use site or brief occupation.

LA 14914

LA 14914 is on the valley bottom at an elevation of 2,237 m. Exposure is west, and Largo Creek is 45 m to the west. Vegetation consists of scattered piñon and juniper and range grasses.

Cultural Remains

The 1976 survey of the right-of-way noted a 2 m long possible rock alignment in the rock-free valley bottom. A sherd and a lithic were also observed (Kayser and Dart 1977).

Excavation Methods

Five two by 10 m long strips were established from a base line. Excavation was in 10 cm levels with no screening. Fill consisted of 5 cm of sandy silty soil over hard clayey soils with few rocks. Feature 2 was excavated to a depth of 5 cm and Feature 3 to a depth of 30 cm with a deeper test to 45 cm below the surface. Four 0.5 m sq tests excavated 50 cm deep were placed in the corners of the grid system. No cultural material was recovered, and the work was abandoned.

Summary

The presence of the rock alignment in the valley bottom suggested a structure. However, the total absence of artifacts and charcoal indicate there was no fieldhouse at this location.

LA 14917 is the farthest south of the Gallo project sites. It is on the east side of Agua Fria valley, 0.8 km from the creek, at an elevation of 2,303 m (Fig. 85). The area is relatively level valley bottom with piñon and juniper woodland, sparse grasses, and narrowleaf yucca (Kayser and Dart 1977:19).

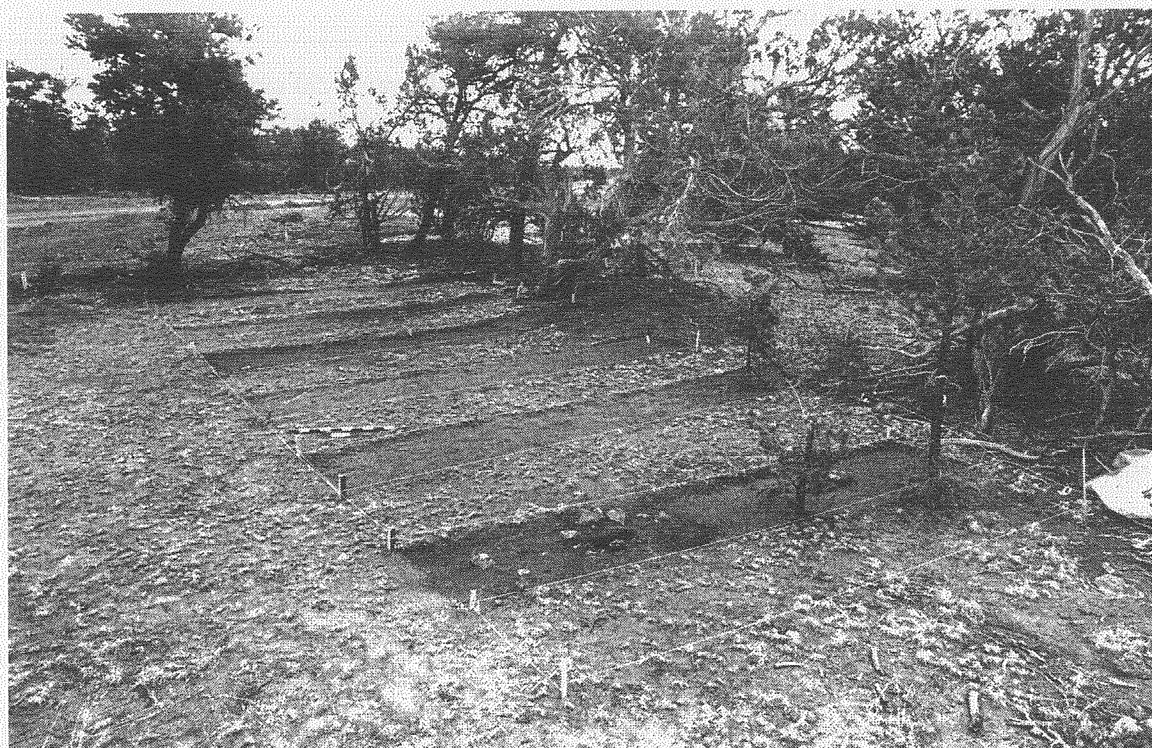

Figure 85. Overview of LA 14917.

Cultural Remains

LA 14917 is about 25 m east of LA 5411, a lithic scatter excavated by Kayser as part of the Castle Rock project. Excavation at LA 5411 revealed a shallow unlined hearth and a few lithic artifacts perhaps dating to the late Archaic, based on two projectile points found on the surface (Kayser 1973:11).

This site was recorded as a 5 by 5 m light lithic scatter. The 1976 right-of-way survey observed 20 to 30 lithic artifacts, including a core and flakes of quartzite, obsidian, fine-grained basalt, and rhyolite (Kayser 1973).

Excavation Methods

The lithic artifacts observed during the survey could not be relocated, and it was assumed that they were removed by unknown persons. A base line, aligned with magnetic north, and six 2 by

6 m strips (Features 1 through 6) were established. East-west control was by 2 m units measured from the base line.

The north half of each strip was excavated and screened. Features 2, 4, and 5 were excavated 5 cm, part of Feature 3 to 10 cm, and part of Feature 6 to 15 cm below the modern ground surface. Fill was tan to light brown sandy silt with few rocks. The color was slightly darker at 5 to 10 cm but otherwise similar. Sterile soil was reached at 10 cm in Feature 3. Sterile soil was described as decomposed rock, volcanically derived gravels, and bedrock. Cultural material was mostly in the upper 5 cm of fill.

The only possible cultural feature was a circular rock alignment 50 cm in diameter in strip Feature 6. It contained no charcoal but could be the remains of a deflated firepit.

Cultural Materials

Lithic Summary

Eleven flakes, two angular debris, a graver, and a possible projectile point were recovered. Rhyolite was the principle material type (Wening, this volume).

Ground Stone, by Charles A. Hannaford

Ground stone from the site consisted of a single spherical sandstone concretion. It is unaltered and measures 3.0 cm in diameter. The specimen was recovered from the fill of Feature 4 and was most likely collected by the site inhabitants as a curiosity piece. It adds little to the interpretation of this small lithic scatter.

Summary

LA 14917 was a sparse lithic scatter with a possible firepit. The few artifacts recovered do not lead to any conclusions concerning site function or date.

LA 14920 is located on a rocky bench 50 m south of Castle Rock Arroyo and 180 m south and west of Largo Creek. The elevation is 2,268 m. Vegetation consists of piñon and juniper park land with range grasses and narrowleaf yucca (Fig. 86) (Kayser and Dart 1977:18).

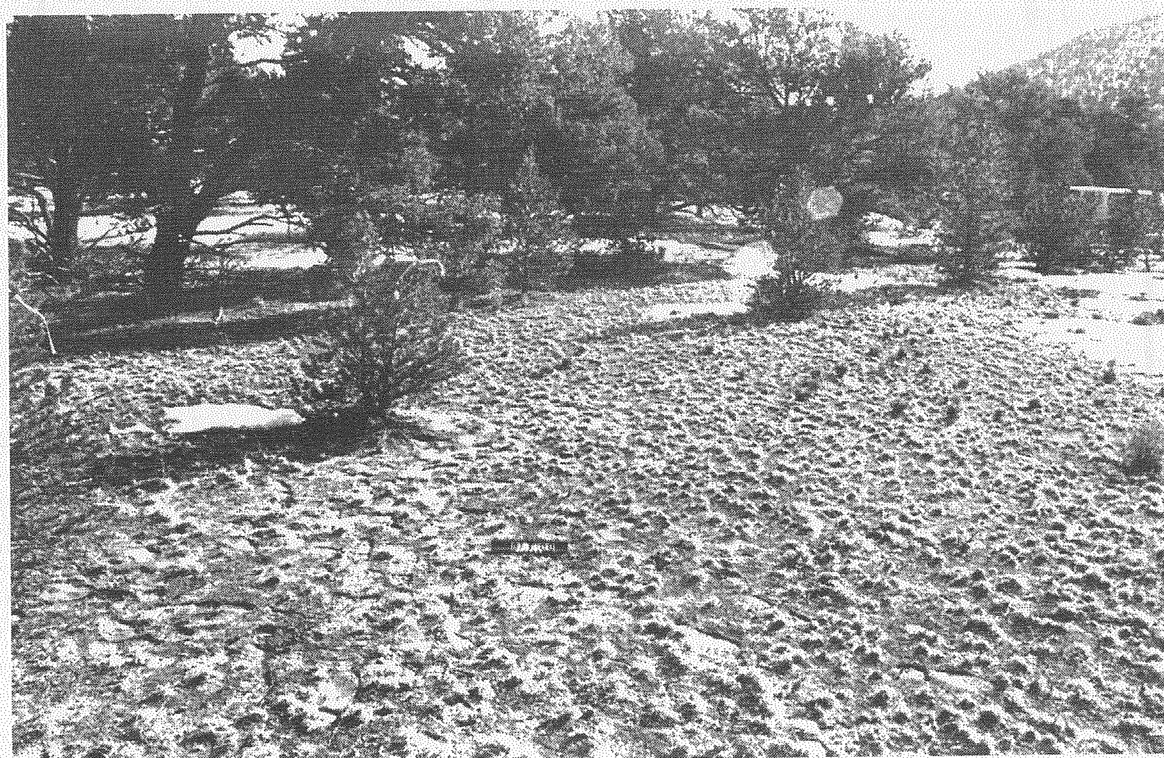

Figure 86. Overview of LA 14920.

Cultural Remains

Recorded during the 1976 survey of the right-of-way, this site was described as a lithic scatter covering an 5,000 sq m area. Numerous flakes of chert, rhyolite, agate, chalcedony, basalt, and obsidian were observed (Kayser and Dart 1977:17-18).

Excavation Methods

Mechanical equipment had previously disturbed approximately 600 sq m of the site within and 100 sq m outside of the right-of-way. As a result, efforts were concentrated in the undisturbed areas. A 40 m long base line was established, and isolated artifacts were plotted by a transit moved along the base line (Fig. 87). Eight clusters of artifacts were noted, and collection circles ranging from 0.5 to 3.0 m (or 6.0 m, if the measurements on the map are believed rather than those recorded on the feature forms) in diameter were collected as single units. In addition, 50 by 50 cm test units in Features 1, 4, 6, and 7 were excavated and screened. The test in Feature 1 was excavated to a depth of 10 cm, the others to 5 cm. Lithic artifacts were in the upper 5 cm of fill described only as sandy soil.

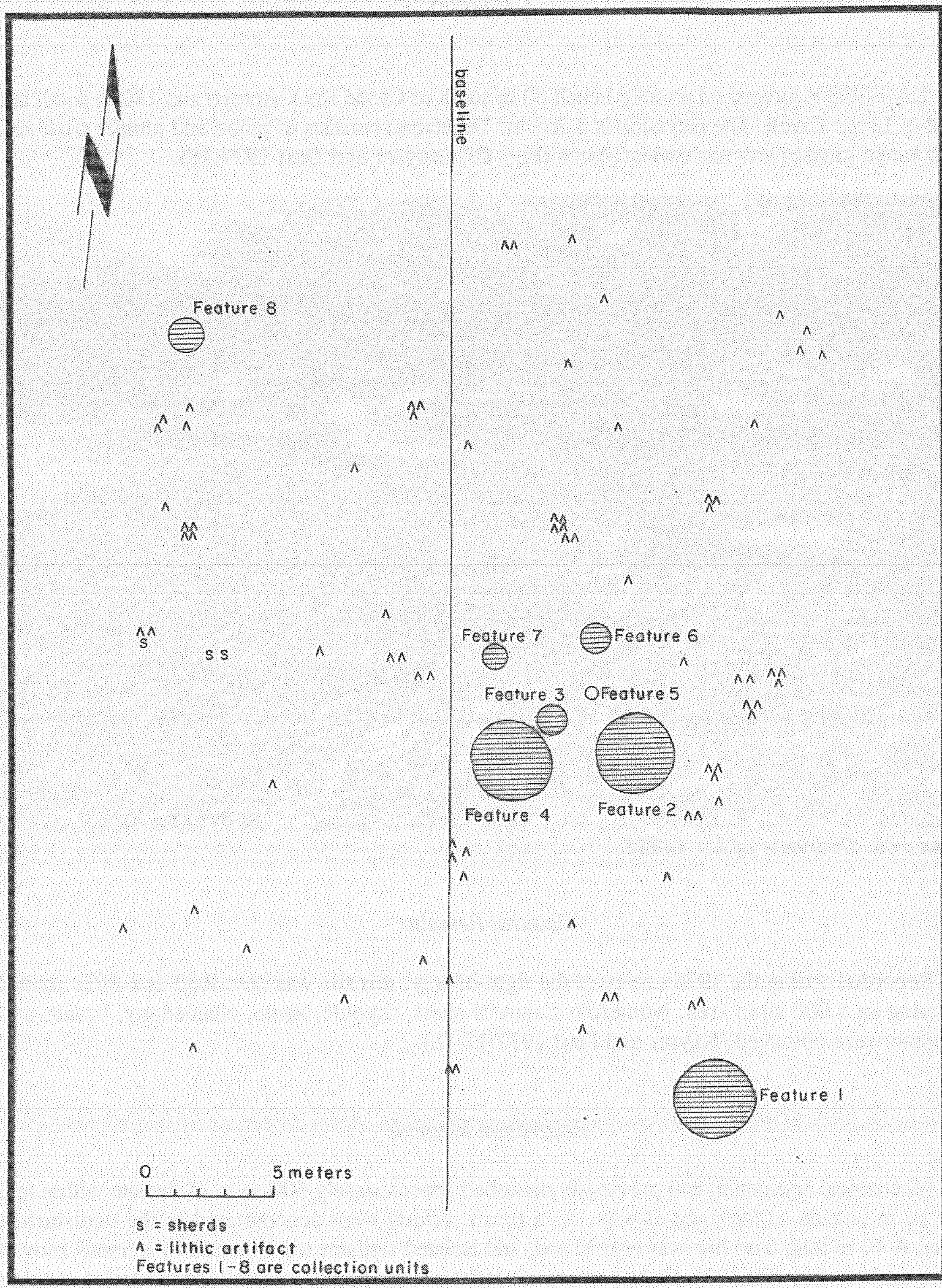

Figure 87. LA 14920 site map.

Cultural Material

Ceramics

Among the lithic artifacts were six sherds, all from west of the base line. Five of these are San Francisco Red jar sherds and the other a direct flattened rim sherd from a Tularosa Filet Rim vessel.

Lithic Summary

Lithic artifacts collected from LA 14920 include 185 flakes (mainly secondary flakes), 18 angular debris, 22 tools, 3 cores, and 2 projectile points. Rhyolite and chert/chalcedony are almost equally represented in the debitage. Tools are primarily of rhyolite. Tool types include shavers, knives, scrapers, a drill, combination tools, and a modified flake (Wening, this volume).

Summary

The collection strategy used at this site--point-plotting tools, circular collections of a few concentrations of debitage, and four small test squares--precludes any conclusions. One scraper resembling an Archaic end scraper, in combination with the sherds, suggests the site area was used over a long period of time.

LA 14930

LA 14930 is in the valley bottom bordering a piñon and juniper woodland with grasses and narrowleaf yucca. Agua Fria Creek is 1.6 km to the west, and the elevation is 2,312 m.

Cultural Remains

This site was surveyed in 1976 as a 15 sq m concentration of lithic artifacts. Materials types observed for the 50 to 60 surface lithic artifacts include chert, basalt, rhyolite, obsidian, and quartzite (Kayser and Dart 1977:20).

Excavation Methods

The field specimen sheets and all but two of the feature forms for this site could not be located, leaving only a small amount of information on the site. The map indicates that six 2 by 10 m strip zones were established. The eastern 1 m of Features 1 to 5 were excavated as well as a 1 by 1 m test labeled Feature 7. Surface and subsurface control was by feature in 2 m units measured north from the base line.

The upper 10 cm of fill consisted of light brown sandy clay and silt with about 10 percent pea-sized gravel. Occasional flecks of charcoal were thought to result from a forest burn rather than cultural features. Soils between 10 and 25 cm deep had more clay and silt, and the gravel was 15 to 20 percent. The color was slightly lighter than the upper fill, and calcium carbonate streaking was observed.

The distribution of lithic artifacts suggests that all or nearly all of the excavated units were taken down at least 10 cm. Features 1, 2, and 3 had lithic artifacts from the 0 to 10 cm level, and Features 4 and 5 from the 20 to 30 cm level.

Cultural Material

Lithic Summary

The LA 14930 lithic assemblage is predominantly debitage--350 flakes and 55 pieces of angular debris. Three scrapers, a knife, three facially reduced flakes, one core, and two projectile points complete the assemblage. Chert/chalcedony is the primary material type. The large number of tertiary flakes suggest formal tool manufacture at the site (Wening, this volume).

Faunal Remains

Four bones were recovered from the surface of the gridded area. One, a jackrabbit (*Lepus* sp.) humerus is of recent origin. The remaining three are burned pieces of the same medium to large mammal long bone shaft fragment.

Summary

LA 14930 produced a good sample of lithic artifacts but little else. No features were encountered, but burned bone suggests there may have been thermal features in the area.

WATER- AND SOIL-CONSERVATION SYSTEMS

James A. Moore

Water- and soil-conservation features have long been recognized in the Southwest, but detailed discussions of these features and their meaning in the cultural record are rare. Bandelier (1890, 1892), Nordenskiold (1893), Stevenson (1894), Hodge (1893), and Mindeleff (1896) were among the earliest archaeologist to recognize water- and soil-conservation features in the Southwest and provide descriptions. Except for the Hohokam canal systems of the Salt and Gila River Valleys in Arizona, little attention was paid to water- and soil-conservation features as integral components of prehistoric subsistence systems until the 1960s and 1970s. Studies like Woodbury's (1961) at Point of Pines, Hayes (1964) and Rohn's (1963, 1977) at Mesa Verde, and Vivian's (1970, 1972, 1974) at Chaco Canyon kindled interest in the analysis of water- and soil-conservation systems. Today such studies are often aimed at integrating water- and soil-conservation system data with population and environmental trends, examining the variables that led to their construction as well as the effects they had on the cultural and physical environments.

Two classes of agricultural systems are recognized in this study: irrigation and dry farming. Irrigation systems transport water from permanent sources to fields. Southwestern irrigation systems often contained diversion devices to channel water from streams into the canals. Lateral ditches, headgates, field borders, spreaders, and retaining walls are other features that can be associated with irrigation systems. Dry farming relies on impermanent water sources, primarily direct rainfall and runoff. Features in this type of complex include slopes, diversion walls, gridded garden plots, and ditches for distributing excess runoff. Only dry-farming features were found by this study. No definite irrigation systems were investigated.

The literature abounds with descriptive terms for water- and soil-conservation features. For this reason, specific definitions are given for each feature discussed, including canals, ditches, check dams, contour terraces, diversion dams, holding dams, grid gardens, and headgates.

The primary difference between canals and ditches is the source of the water being transported. Canals carry water from a permanent source to fields; ditches carry water from an impermanent source to fields. Thus, a canal can be used to move water from a perennial stream to a farming area, and ditches can transfer water from the canal to specific fields. By definition, the size of the feature makes no difference; a canal can technically be smaller than a ditch.

Check dams are linear stone alignments of varying length, height, and width which are placed across erosional channels to trap soil and slow the velocity of runoff. Contour terraces are similar linear stone alignments which are placed perpendicular to the slope of a hill to stabilize existing soil, trap eroded soil, and slow runoff velocity. These features are similar in construction style and function, generally varying only in placement. While check dams are normally filled by erosional processes, the deposits behind contour terraces can be of natural or cultural derivation. Small areas amenable to cultivation were provided by both types of feature.

Diversion walls fall into several categories. When placed across erosional channels that carry a considerable amount of runoff, they can serve as diversion dams, channeling flow in a new direction. Water can be channeled into one or more ditches by such features or can be temporarily impounded for later allotment to fields. Another type of diversion wall occurs in association with check dams or contour terraces and serves to divert excess runoff from the system. Still another variety acts as a spreading device within a field, redirecting runoff to specific areas. This type is often of impermanent construction, built during a specific rainfall or runoff episode to ensure equal delivery throughout the system.

Holding dams are built across erosional channels to impound water. The main difference between holding dams and diversion dams is that the former are designed to impound water on a relatively permanent basis for domestic use, and the latter temporarily hold water for primarily agricultural use.

Grid gardens are linear stone alignments which are subdivided into a series of cells or grids. These features generally occur on level ground or very gentle slopes, and in some areas are gravel mulched. Headgates occur with several types of features. In canals and ditches they control the flow of water through the system. In contour terraces they are simple breaks in the terrace wall that allow excess runoff to pass into lower parts of the system.

Description of Sites

Water- and soil-conservation features were investigated at eight sites. Individual features included check dams, check dam/diversion walls, contour terraces, possible grid gardens, diversion dams, headgates, canals, and ditches. The intensity of investigation conducted at each site ranged from mapping and description to partial or complete excavation. In one case (LA 14916), the water-control features were no longer present at the time of excavation. Site descriptions contain survey observations, results of the intensive investigation, and descriptions of all features within the right-of-way.

LA 6076

LA 6076 is on a ridge flanking the east side of Largo Creek at an elevation of 2,231 m. During survey, the site was recorded as a small pueblo containing up to four masonry rooms, a trash area, and a possible isolated room (Kayser 1976). Based on the types of ceramics noted, a Reserve phase date was assigned.

During excavation a system of three check dams (Features 5, 25, and 26) was found across an erosional channel approximately 10 m north of the main roomblock (Fig. 88). All three features were excavated, and adjacent portions of the drainage were trenched to determine whether other check dams were present. The system was investigated by excavating a series of five contiguous 8 by 1 m surface strip areas to a depth of about 0.18 m perpendicular to the erosional channel. The soil between and behind the features was a rocky loamy silt containing cultural materials, including ceramics, lithic, bone, and charcoal. A trench measuring 3 by 0.5 m was placed to the east of Feature 26, the uppermost check dam in the system, and excavated to a depth of 0.15 m to determine whether other features were present. This trench was placed within the erosional channel parallel to the direction of flow. No other features were discovered.

Check-dam walls were constructed of dry-laid, locally obtained basalt cobbles and pebbles (Fig. 89). Elements were piled across the erosional channel rather than coursed or stacked into anything resembling a formal wall. The check dams were spaced about 1 m apart and averaged 3.57 m long, 0.7 m wide, and 0.3 m high. Small agricultural plots were formed by these features,

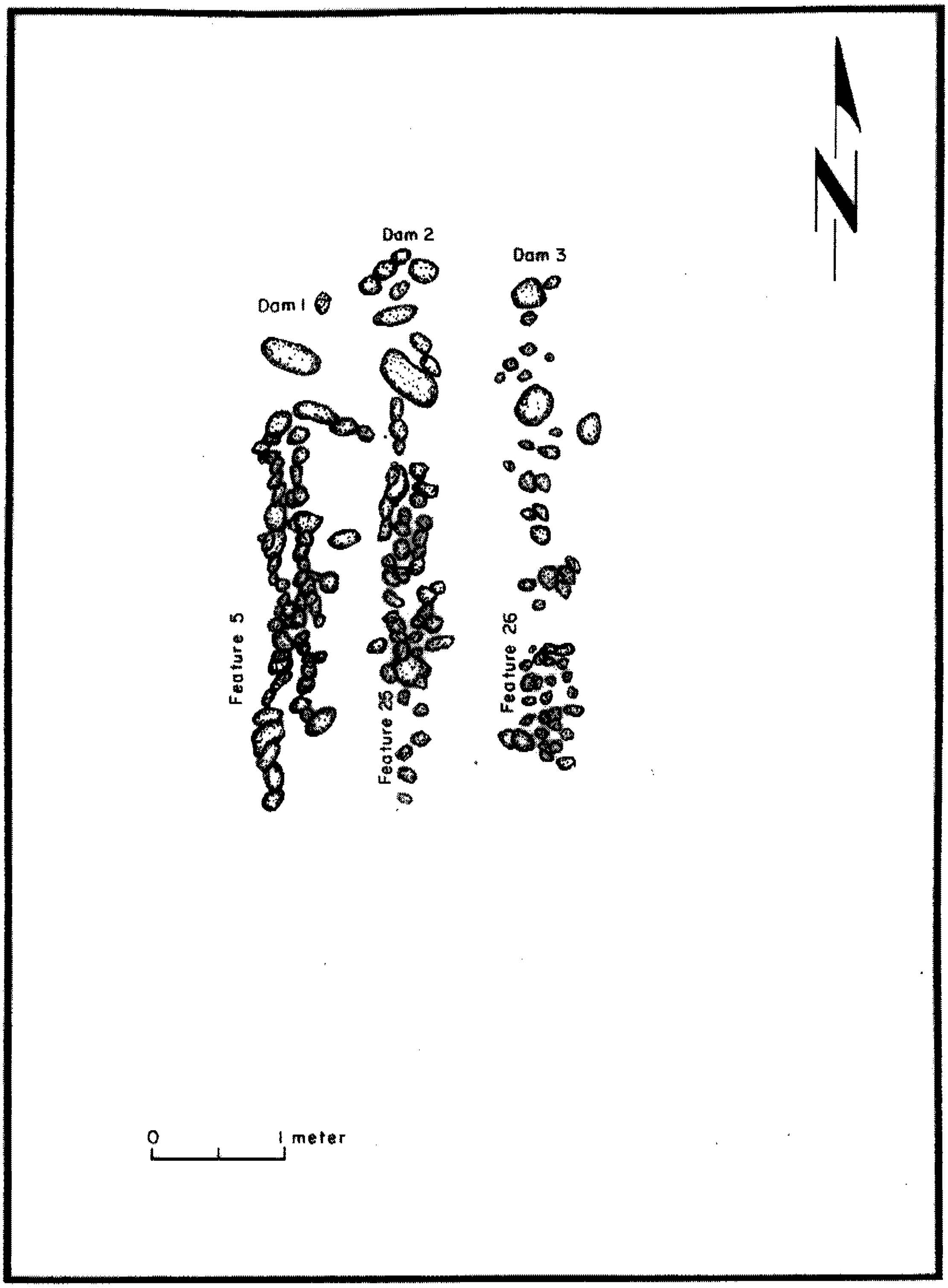

Figure 88. Plan view of water- and soil-conservation features at LA 6076.

and much of the fill contained cultural materials discarded by the inhabitants of nearby surface structures, indicating that the system was constructed during or after occupation of the rest of the site. There was no evidence of intentional filling. Cultural materials probably found their way into the dam deposits through erosion of the surrounding surface or discard into the gully. Feature 5 exhibited the highest quality of construction in the system. Features 25 and 26 were rather haphazardly constructed. Since materials dating to the Tularosa phase were recovered from deposits behind and between the features, it is likely that the Reserve phase date that was originally assigned is incorrect, and the features originated during or after the Tularosa phase.

Figure 89. Check dams built across a small ridge to drainage north of the roomblock at LA 6076.

LA 14463 is adjacent to an erosional channel in a rincon east of Largo Creek at an elevation of 2,217-2,220 m. Features noted during survey included a possible channel realignment or ditch, check dams, a boulder dam, contour terraces, and grid gardens (Kayser 1976). The course of the possible ditch was marked by a faint linear depression and concentrations of wolfberry bushes. The possibility that this feature represents an old arroyo channel was also mentioned. Other linear rock alignments and rock piles were noted further up the same canyon but are outside the right-of-way. An estimated date of post-A.D. 900 was assigned because of the presence of water- and soil-conservation features.

Only a small part of this system is within the right-of-way. Water- and soil-conservation features investigated included two check dams and a possible ditch (Fig. 90). A 7.0 by 0.75 m test trench running northeast to southwest was placed across an area containing two shallow linear depressions (Feature 3) thought to represent one or more ditches. The trench was excavated to a depth of 1.10 m, with a sherd and some charcoal occurring at 0.60 m below surface, and a scatter of charcoal at 0.75-1.10 m below surface. No definite evidence of a ditch was recovered. The stratigraphy revealed in the test trench suggested that the linear depressions represented localized erosional channels cutting through alluvial deposits.

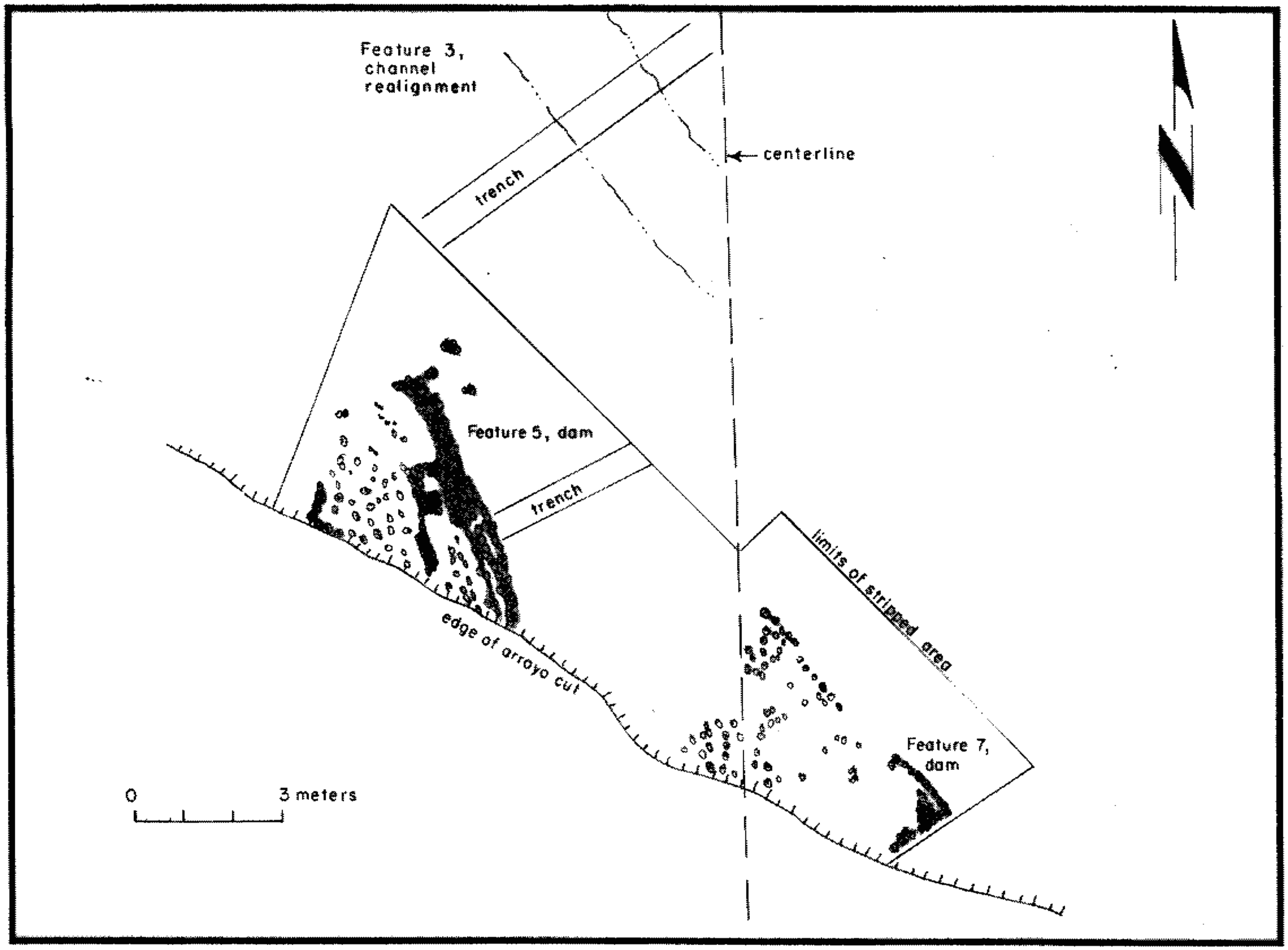

Figure 90. Plan view of LA 14463 showing water- and soil-conservation features and areas of excavation.

An area measuring 10.0 by 4.2-6.0 m adjacent to the edge of the arroyo was surface stripped to investigate Feature 5, a probable dam. Approximately 0.2 m of sandy alluvial loam containing some gravel was removed. A second area measuring 10.0 by 2.0-5.2 m was surface stripped adjacent to the first to investigate another probable dam, Feature 7. Approximately 0.2 m of sandy alluvial loam containing some gravel was removed. A 3.0 by 0.5 m trench was excavated east of Feature 5 to a depth of 0.8 m, encountering alluvial sandy loam, sand, and gravel. A third trench measuring 1.5 by 0.5 m was excavated to a depth of 0.4 m on the west side of Feature 7, encountering alluvially deposited sandy loam containing some gravel. No rocks or adobe underlaid the surfacial cobbles associated with Feature 7 in this trench.

Both dams were constructed of basalt cobbles stacked in linear piles across a former erosional channel (Fig. 91), with original heights estimated at 0.35 m. The function of these features remains problematic, but it is felt that they were either check dams or diversion dams. The original size and configuration of the dams was obscured by erosion, which had removed the southern portions of both features and scattered the cobble building elements. Feature 5 appeared to consist of a 4.2 by 0.9 m basalt cobble alignment, with cobbles scattered to the southwest by erosion. Feature 7 was more amorphous but seems to have consisted of a 5.2 by 0.9 m basalt cobble alignment, again with elements scattered to the southwest by erosion. Both dams probably originally contained multiple courses, both vertically and horizontally. No temporally diagnostic artifacts were recovered during excavation, so the estimated date of post-A.D. 900 could not be confirmed.

LA 14912

LA 14912 is on a wooded west-facing slope flanking Largo Creek at an elevation of 2,234 m. Features noted during survey included a single linear check dam within the right-of-way, with a series of similar features continuing up the same gully outside the right-of-way (Kayser and Dart 1977). A similar agricultural site, LA 14911, was recorded 90 m east of LA 14912. Because no temporally diagnostic artifacts or features were observed during survey, no date was assigned.

The intensive investigative phase consisted of instrument mapping and detailed recording of the single feature within the right-of-way (Fig. 92). The check dam (Feature 1) consisted of a 12 m long by 0.2 to 0.4 m wide linear alignment of locally obtained basalt cobbles constructed across a minor gully. Erosion had removed the central portion of the feature, so only the ends of the check dam were intact. Feature 1 appears to have been a single course high and wide. No associated cultural materials were found, so the site remains undated.

LA 14913

LA 14913 is at an elevation of 2,233 m near the base of a heavily wooded slope adjacent to an erosional channel which drains west into Largo Creek. The only feature noted during survey was a 2 m long rock alignment (Fig. 93) thought to represent the remains of a one- or two-room fieldhouse (Kayser and Dart 1977). Several polished brown ware sherds resembled the uncorrugated lower portions of the Reserve series of alignment. This and the possibility of a masonry surface structure suggested that the site dated to the Reserve phase.

Since this site was situated along the right-of-way boundary, no excavations were conducted. The intensive investigative phase consisted of instrument mapping (Fig. 94) and detailed recording of features within or directly adjacent to the right-of-way. Upon further examination, the site was discovered to be more extensive than thought during survey, and it was determined to be

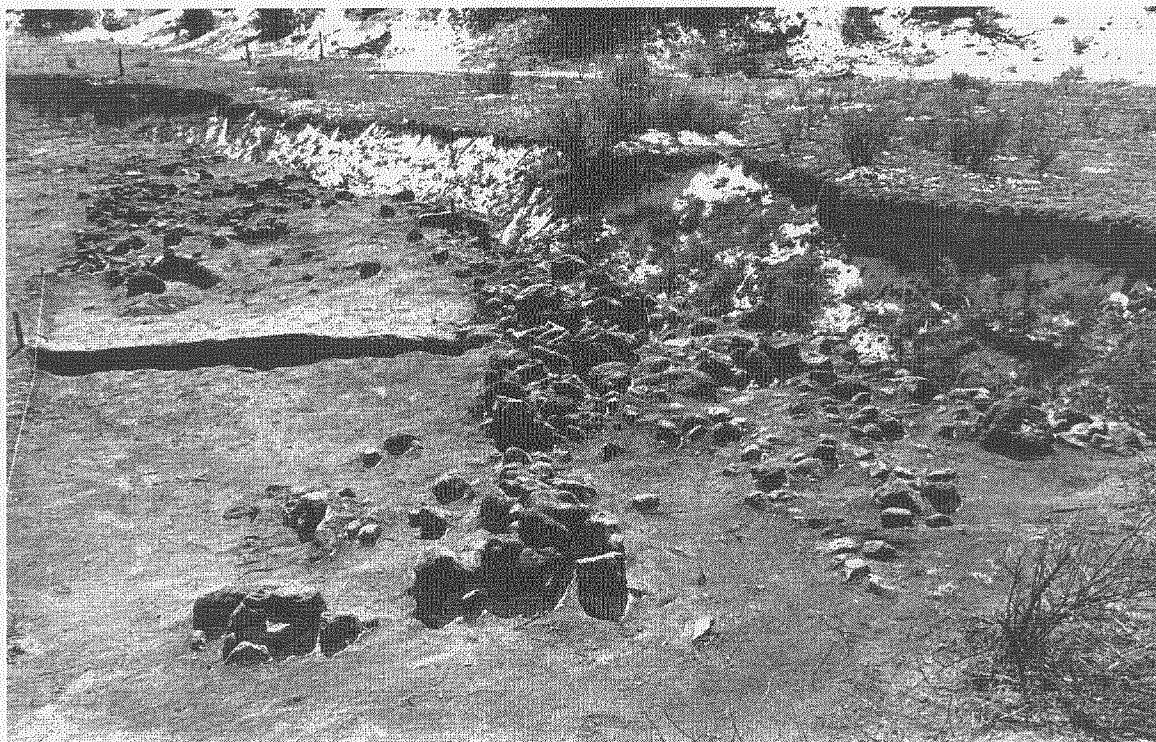

Figure 91. Check dam at LA 14463.

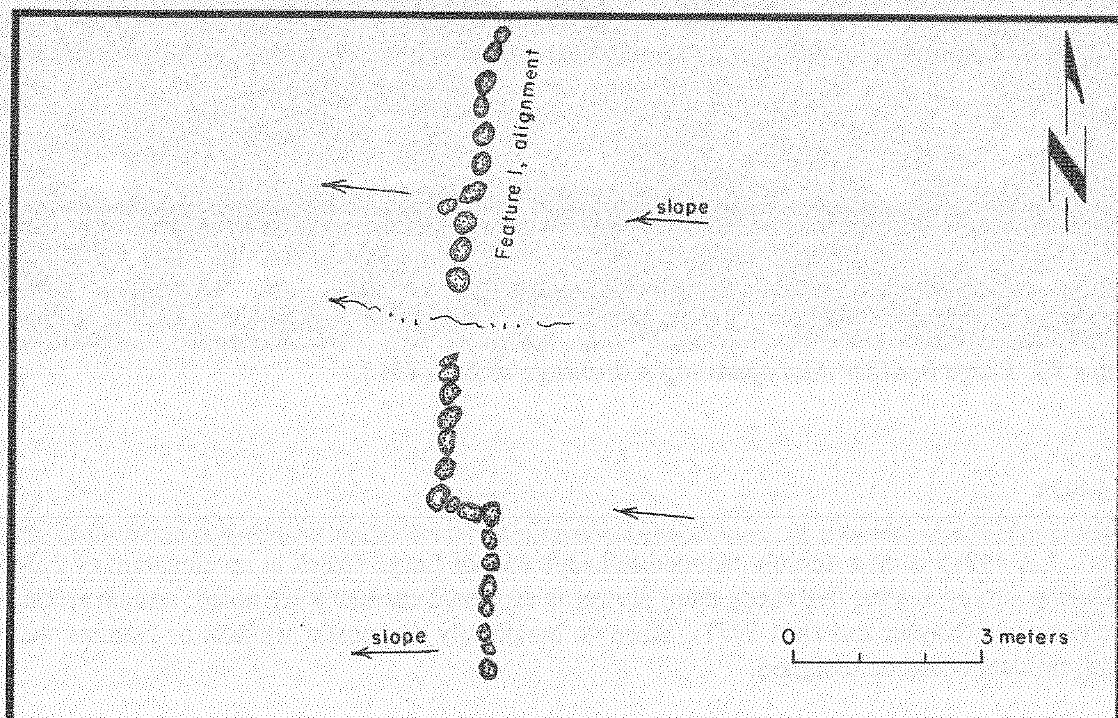

Figure 92. Plan view of LA 14912.

agricultural rather than residential. Several types of features comprise this complex. The easternmost feature (Feature 1), which is also highest in the system, was a large boulder dam spanning the primary erosional channel in that portion of the hillslope. Feature 1 was situated outside the right-of-way and was not described in detail, so it is not possible to determine how it functioned. However, it is most likely that the feature was a check dam. About 4.5 m downslope from Feature 1 was a probable contour terrace (Feature 2). The most prominent feature at the site was a U-shaped boulder contour terrace (Feature 3), 22.5 m west and downstream from Feature 3, which contains a 4.5 m long cobble alignment that might be an agricultural plot (Feature 5). No additional temporally diagnostic artifacts were found during intensive investigation. Since no structure was present and the ceramics noted during survey were not definitely assignable to the Reserve phase, no accurate date can be provided.

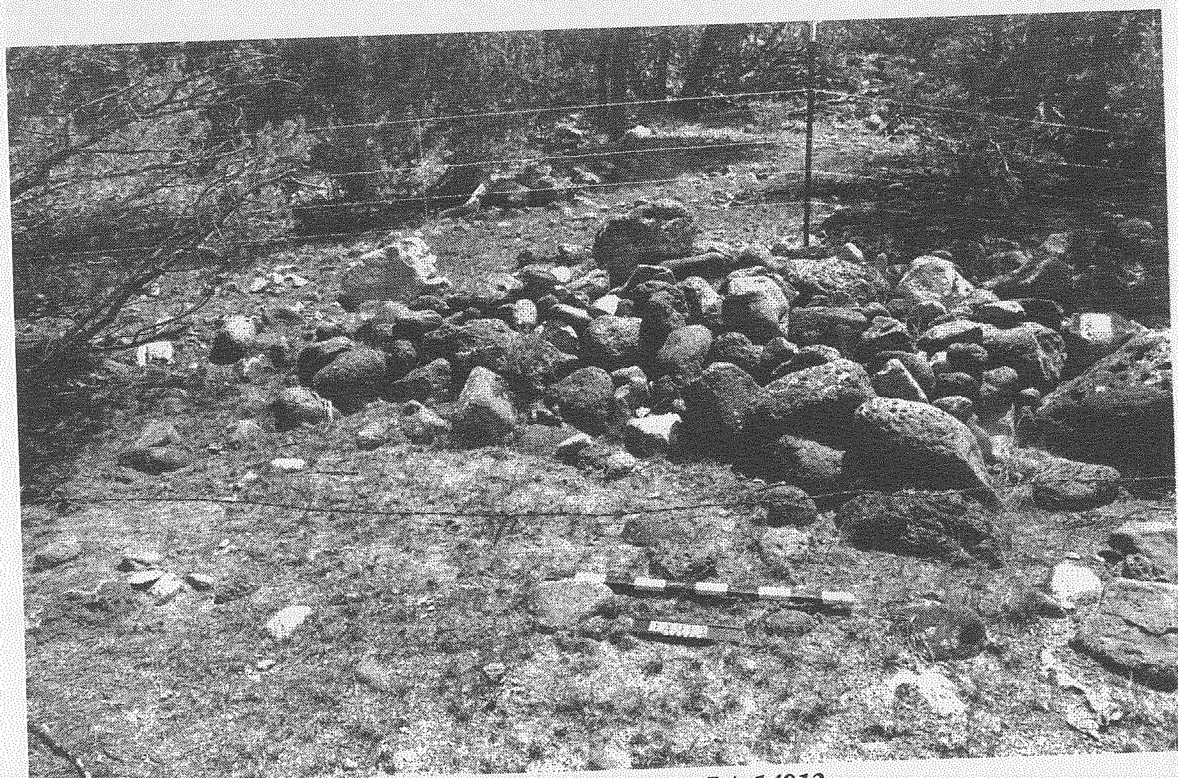

Figure 93. Large boulder dam spanning a drainage at LA 14913.

LA 14915

LA 14915 is on a densely wooded hillslope east of Largo Creek at an elevation of 2,243 m. During survey at least five check dams across an erosional channel were noted, and no artifacts were observed (Kayser and Dart 1977). Since no temporally diagnostic artifacts or features were found, no date could be assigned.

A single test grid was excavated to recover pollen and soil samples. Intensive investigation consisted primarily of instrument mapping and detailed recording of features within the right-of-way. Ten features were defined (Fig. 95)--eight check dams (Features 2-9), one check dam or diversion dam (Feature 10), and one contour terrace (Feature 1). Three check dams (Features 7-9) outside the right-of-way averaged 4.51 m long, 1.13 m wide, and 0.79 m high. They were spaced

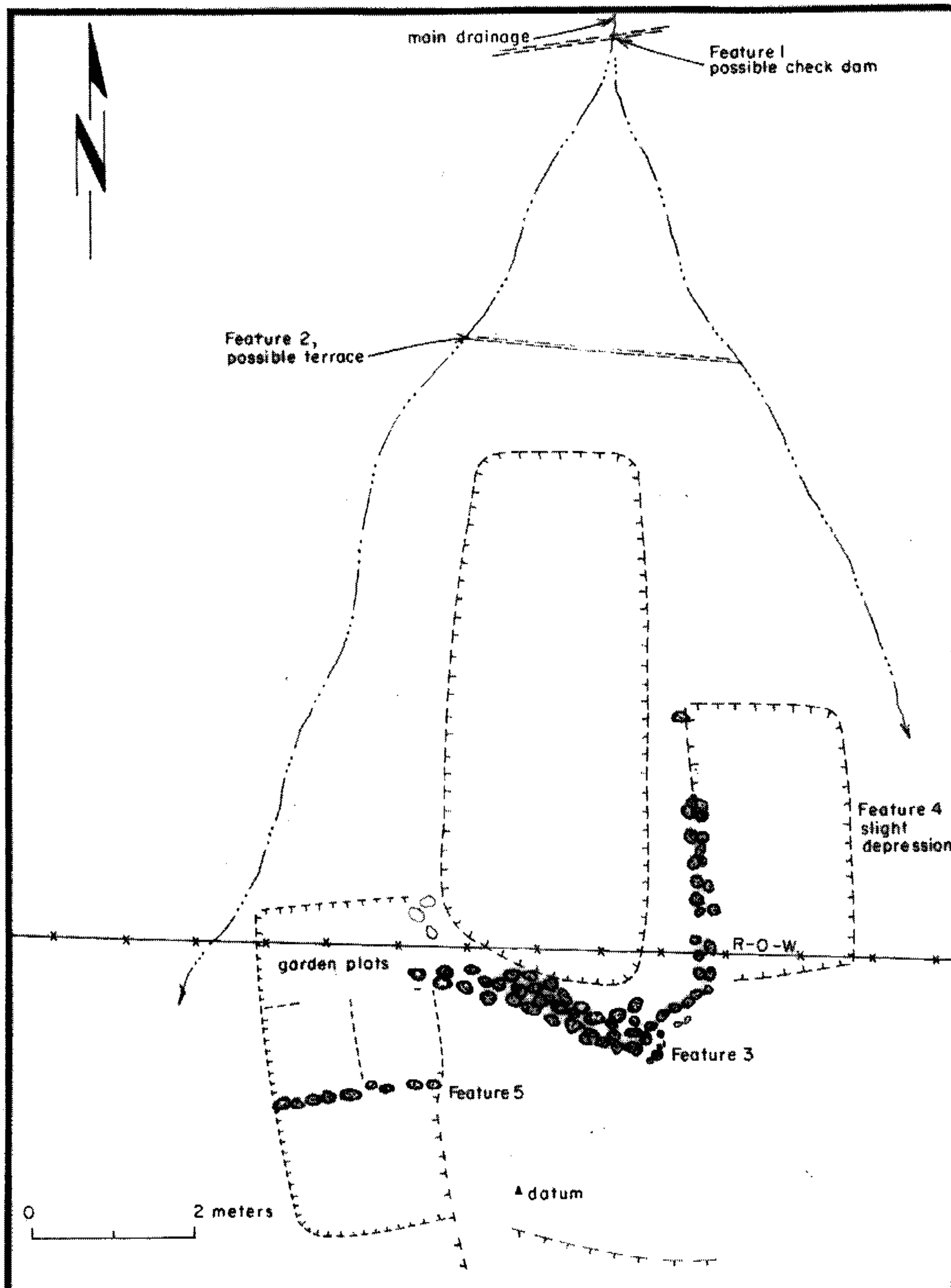

Figure 94. Plan of confirmed and possible features at LA 14913.

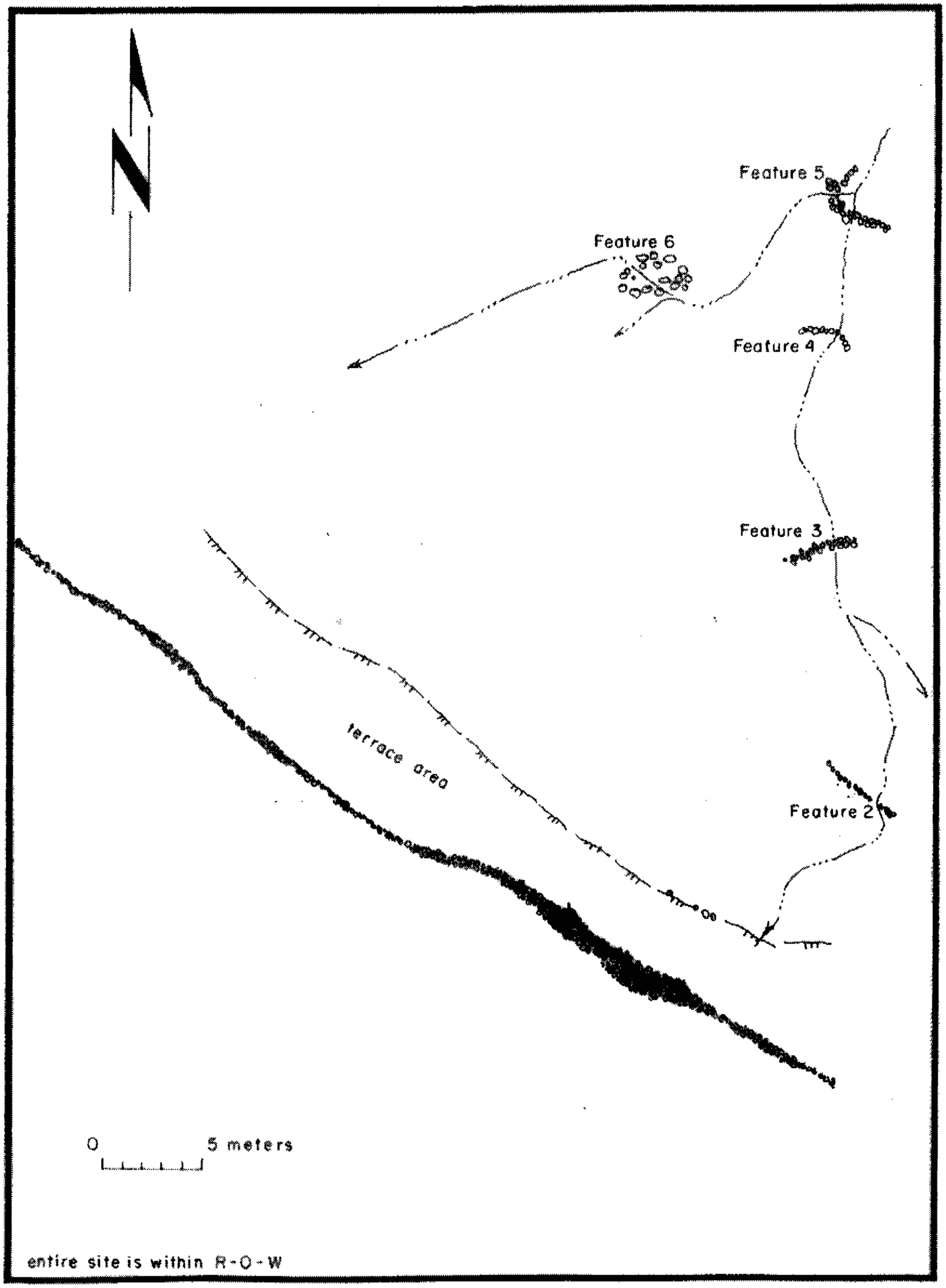

Figure 95. Plan of features within the right-of-way, LA 14915.

an average of 7.30 m apart and were constructed of locally obtained basalt and tuff cobbles. The amount of rubble associated with a few of the features suggests that the average height provided above is probably conservative, and the dams may have originally stood higher. Two intact check dams outside the right-of-way had triangular areas of soil built up behind them, which probably served as small garden plots. Approximately 24.4 sq m of land was available behind these features for agricultural use. Construction techniques varied from uncoursed piles to crudely coursed masonry, the latter occurring in only four dams.

Figure 96. Contour terrace along the tow of the slope at LA 14915.

Below the break in slope and lowermost in the system was a 41.0 m long by 2.0 m wide contour terrace wall (Feature 1). Building elements were locally obtained basalt and tuff cobbles piled several courses high (Fig. 96). A narrow strip of level land behind the terrace wall probably formed an agricultural plot and would have provided about 164 sq m of farmable land. A test grid was excavated into this feature to recover soil and pollen samples. No evidence of artificial fill was found. At the approximate midpoint of the check-dam system, one of the features was defined as a channel-switching device (diversion wall), allowing water to flow down the main channel into the lower check dams or onto the contour terrace.

No artifacts were found in direct association with these features. Eight choppers and a maul were not collected and provide no temporal information. No date was assigned to these features.

LA 14916

LA 14916 is located on the same densely wooded hillslope as LA 14915 at an elevation of 2,234 m. Situated about 30.5 m east of LA 14915, LA 14916 may have been part of the same water- and soil-conservation system. It is described as an alignment of cobbles across a small erosional channel (Kayser and Dart 1977). The presence of two vertical slabs in the center of the feature suggest a small holding dam with a headgate. However, it is more likely that this configuration was caused by erosion and that the feature was simply a check dam. No temporally diagnostic artifacts or features were noted during survey, so no date was assigned. Unfortunately, nothing was left of this site by the time excavation was initiated, so no further investigations were conducted. It seems likely that this feature was originally part of the same water- and soil-conservation system as LA 14915. It was probably a check dam used to control erosion and collect soil in a small drainage that was tributary to the one in which LA 14915 was situated.

LA 14918

LA 14918 is on the gravel and cobble fan of a hillside gully east of Largo Creek at an elevation of 2,243 m. It is described as a series of linear rock alignments crossing several erosional channels on an outwash fan (Kayser and Dart 1977). No temporally diagnostic artifacts or features were noted, so no date was assigned.

The intensive investigative phase consisted of instrument mapping and detailed recording of features within the right-of-way. Out of a system of 24 check dams across a series of three interconnected gullies, five were within the right-of-way (Fig. 97). The features averaged 3.64 m long by 0.46 m wide and were all constructed of crudely stacked locally obtained basalt cobbles. The five check dams within the right-of-way (Features 1-5) averaged 3.12 m by 0.46 m and appear to have been one or two courses wide. The center sections of several dams were removed by erosion. Feature 3 was L-shaped, with a two-course-wide leg paralleling the drainage and running downslope. A check dam situated outside the right-of-way near the top of the system where the northernmost of the three gullies diverts from the main drainage may have functioned as a channel switching diversion wall. The investigators felt that this feature was used to switch runoff from one channel to another, controlling the distribution of water through the system. No temporally diagnostic artifacts or features were found, so the site remains undated.

LA 14919

LA 14919 is on a west-facing wooded hillslope flanking Largo Creek at an elevation of 2,259 m. It was originally defined as a check dam across an erosional channel and a nearby contour terrace, both about 5.0 m long (Kayser and Dart 1977). No temporally diagnostic artifacts or features were found, so no date was assigned.

The intensive investigative phase consisted of the instrument mapping (Fig. 98) and detailed recording of features within the right-of-way. Eight check dams (Features 1-2, 4-9) and a possible channel switching diversion dam (Feature 3) were identified, all built across a hillside gully. The contour terrace recorded during survey was redefined as a check dam. Individual features averaged 4.30 m long by 0.61 m wide and were spaced about 4.4 m apart. They were constructed of unmodified, locally available basalt cobbles and boulders. Only two check dams were intact (Features 1 and 9), the center portions of the other seven features having been removed by erosion. Triangular areas averaging about 7 sq m represent soil buildup behind the intact features and probably served as agricultural plots. A possible channel-switching device (Feature 3) was defined near the lower end of the system. The gully has cut a new channel around the uppermost check dam in the system (Feature 9), reentering the original channel between Features 7 and 8. No temporally diagnostic artifacts or features were found during this phase of work, so the site remains undated.

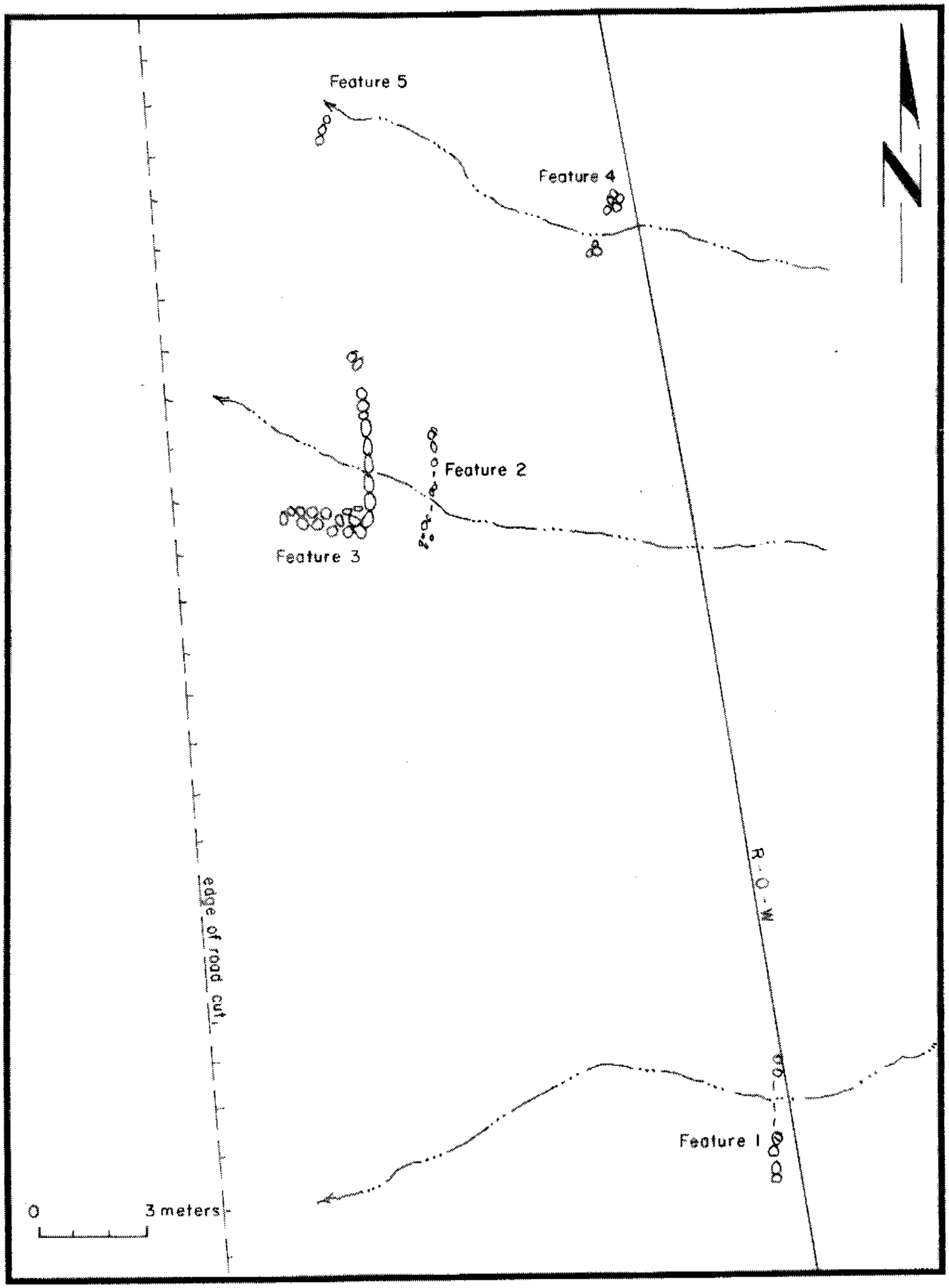

Figure 97. Plan of features within the right-of-way, LA 14918.

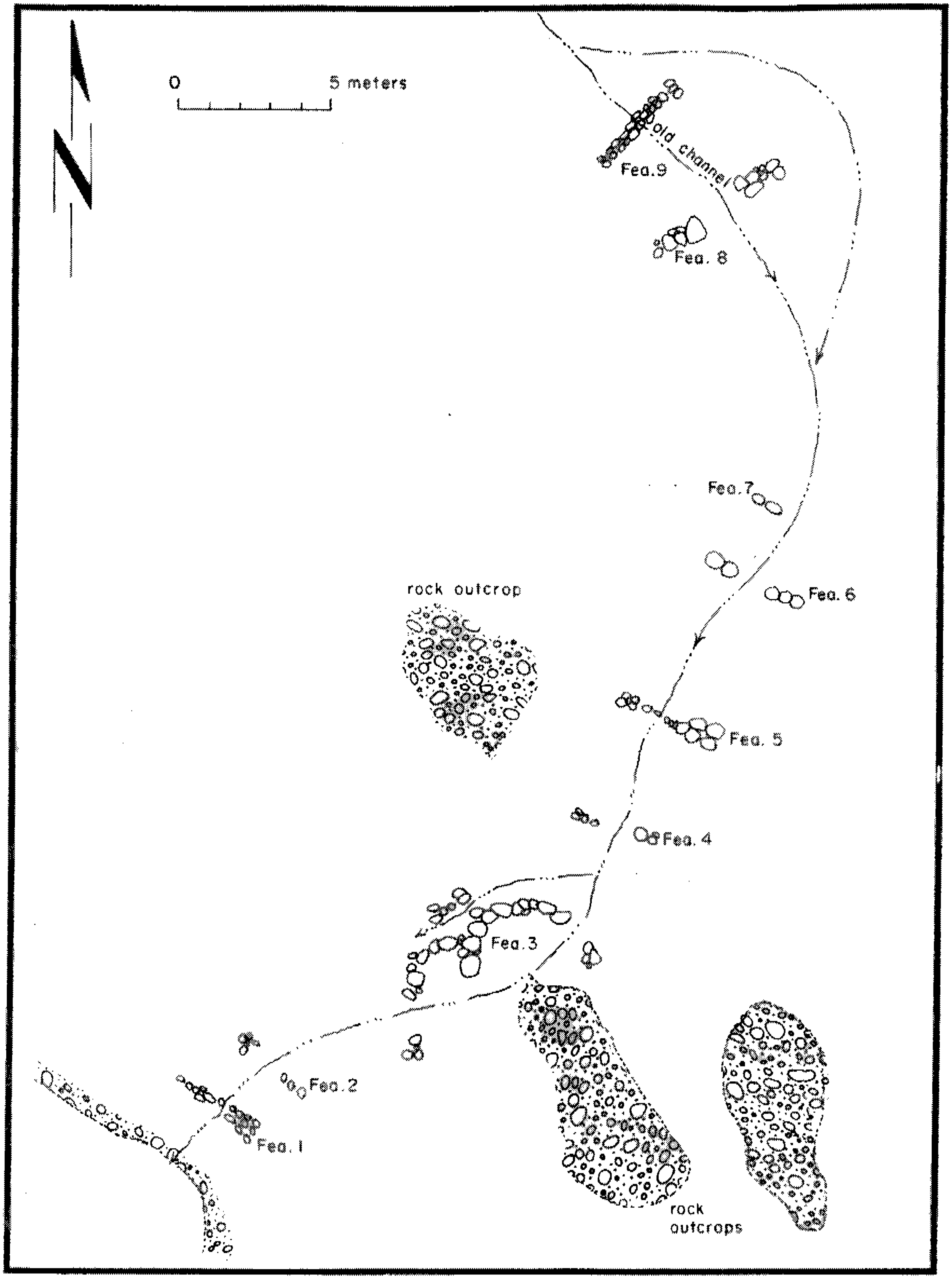

Figure 98. Plan of LA 14919, showing the location of features in relation to the drainage pattern.

Discussion

Distribution of Mogollon Water- and Soil-Conservation Features

Check dams, contour terraces, grid gardens, diversion walls, and ditches are water- and soil-conservation features that occur throughout the Southwest. Moore (1981) discusses the distribution of water- and soil-conservation systems throughout that region, showing that similar features occur in the Anasazi, Hohokam, and Mogollon areas. Water- and soil-conservation features are relatively common in the Southwest, but for many years they were accorded only passing reference unless spectacular systems were present, like the Hohokam canals of the Phoenix area (Halseth 1932; Judd 1930; Turney 1929), the extensive terracing in the Point of Pines and Mesa Verde areas (Haury 1945; Hayes 1964; Nordenskiold 1893; Woodbury 1961), and the gravel-mulched grid-garden systems of the Chama Valley (Bandelier 1890, 1892; Hibben 1937).

Most of the reported Mogollon water- and soil-conservation systems are located in two areas--Point of Pines in southeastern Arizona and the Mimbres region of southwestern New Mexico. Haury (1945) reported contour terraces and possible grid gardens in the Forestdale Valley near Point of Pines, and noted that reservoirs occur near several villages. Woodbury (1961) described ten systems at Point of Pines, noting that they were representative of the scores of such sites occurring in that area. Contour terraces were the most common type of feature, but check dams also occur frequently. Linear stone alignments were occasionally used to create garden borders, but rarely formed actual grids. Several types of features were often combined within an individual system. Contour terraces, check dams, and grid borders occur at the Clover Park site (AZ W:9:30); contour terraces and check dams were combined at AZ W:9:84, AZ W:10:113, and AZ W:10:114; and contour terraces and grid gardens occur at the Rocky Point Farm site (AZ W:10:108) and AZ W:10:115. Wheat (1952) tested four features at Point of Pines, determining that two were reservoirs and two were walk-in-wells. Woodbury (1961) notes that there is no evidence that any of these features were ever linked to agricultural fields, so their function was probably to provide or store water for domestic use. Olson (1960) reports a reservoir with a ditch leading into it from a nearby drainage and a system of four check dams at the Dry Prong site, 26 km east of Point of Pines.

LeBlanc (1977) documents four check-dam systems in the Mimbres Valley. Sandor (1983) studied several contour terrace and check-dam systems in the Mimbres area and provides a detailed analysis of soils and associated geomorphological processes. Bandelier (in Lange and Riley 1970) notes the presence of grid garden and contour terrace systems in the Mimbres region and indicates that a reservoir is located in the Mimbres Valley, 48 km northwest of Deming. The most extensive study of water- and soil-conservation systems in the Mimbres area was conducted by Herrington (1979) along the Rio de Arenas, a tributary of the Mimbres River. In the northern section of the Rio de Arenas Valley, Herrington (1979) found numerous check-dam and contour-terrace systems, estimating that at least 700 individual check dams occur in that area. Contour terraces and check dams were often combined in a system. Small clearings were occasionally found in upland areas, where scattered stones had been removed from the surface and placed at the downslope edge of clearings. Water- and soil-conservation systems were more complex in the middle section of the valley. Features recorded in that area include irrigated plots, canals, ditches, diversion walls, and check dams. Canals and irrigated fields are situated on the floodplain proper, the latter represented by a series of shallow depressions. Check dams and diversion walls (or spreaders) may have been constructed to protect fields from erosion. At least one ditch appears to have had a similar function, having been placed at the toe of a slope to divert runoff from fields. Contour terraces may be present at one spring; otherwise, they do not occur in this portion of the valley.

Other water- and soil-conservation systems have been reported at scattered locations around the Mogollon region. Kidder et al. (1949) noted check dams near Timberlake Ruin and the Cora Sanford Ruin in southern Hidalgo County. Two systems containing three check dams were found near Springerville (Wood 1978). In the Forestdale region, Rice (1980) found possible check dams at AZ Q:13:9.

Numerous water- and soil-conservation systems, including those investigated by this project, have been recorded in the Gallo Mountain region of west-central New Mexico. During a survey in Agua Fria and Largo canyons, Kayser (1972b) found three water- and soil-conservation systems. The system at LA 5406 contained two check dams, a diversion wall, a boulder dam, a series of contour terraces, a diversion wall, a boulder dam, a series of contour terraces, a possible ditch, and a fieldhouse. A similarly complex system was present at LA 10984, containing a large basalt boulder dam, 16 contour terraces, several piles of cobbles, and two clusters of 2-4 room field structures. At LA 5408 he found a fieldhouse with two associated check dams. Near the sites described earlier, Kayser and Dart (1977) also located possible water- and soil-conservation features at LA 14911 and LA 14883, a four-room Reserve phase hillside pueblo. During survey and excavation near Gallita Springs, Kayser (1972c) located a diversion wall at LA 6082, a check-dam system at LA 6081, and a possible agricultural terrace and associated fieldhouse at LA 6080. At LA 6083 a check dam was found in association with a two-room field structure (Kayser 1975). Each of these sites appears to date to the Reserve and/or Tularosa phases. Tierney (1972) indicates that possible agricultural terraces occur on a slope behind LA 4987 in the Apache Creek region, containing an atypical growth of agave that led her to believe that it was being cultivated in this and similar features. Also in the Apache Creek region, Allen (1969) located two check dams across a gully just north of the Armijo site (LA 8889), which dates to the Reserve and Tularosa phases. At LA 5240 in the Harris Creek Valley, Kayser (1972a) located what he believes to be a pair of canals, one on either side of the drainage.

Though this discussion is not at all comprehensive, it is obvious that water- and soil-conservation systems are relatively common and widespread throughout the region occupied by the Mogollon. In areas that have been extensively surveyed in recent years--the Mimbres, Pine Lawn, and Gallo Mountain regions, for example--numerous water- and soil-conservation systems have been found.

Analysis of the Gallo Water- and Soil-Conservation Systems

An array of water- and soil-conservation systems was investigated during the Gallo project. Information concerning the individual features in these systems, when available, is summarized in Table 99. In general, water- and soil-conservation systems can be classified as oriented toward resource conservation or toward supplementing available agricultural resources (Moore 1981). The resource being conserved or supplemented can take several forms. Where erosion is a concern, conservation systems can be constructed to counter the effects of gullying and sheet washing. Check dams can be built across active gullies to slow the runoff velocity and trap soil that would otherwise have been carried away. Contour terraces can be used to stabilize soil on slopes, trap sheet-washed soil, and slow runoff, allowing more moisture to soak into the ground. In these cases both soil and water are conserved. When land or water resources are in short supply, systems that supplement existing agricultural resources can be built. Artificially filled contour terraces can provide arable land where it did not previously exist. Similarly, the use of gridding and gravelmulching can make cultivation feasible in areas where it was not previously possible. Canals and ditches redistribute water supplies, allowing arid lands to be farmed. Similarly, diversion walls and ditches can be used within a water- and soil-conservation system to ensure even distribution of water.

The idea that water- and soil-conservation systems were built in response to stress is critical to this discussion. By examining feature types, construction techniques, and placement, an idea of the type of resource under stress can be derived. The construction of such features represents an intensification of the agricultural system, an intensification that would not have occurred if stress was not involved. Even with low building costs, it is doubtful that water- and soil-conservation features would have been constructed unless they were absolutely necessary. When costs were high, it is almost certain that the systems would not have been built if there were cheaper or easier solutions to the problem.

When a subsistence system is under stress, several options are open to alleviate that pressure. The least cost option is switching to alternative food supplies. This could involve increasing the percentage of wild plant and animal food in the diet or reverting to a hunting and gathering lifestyle for a period of time. If this response is not possible, the use of more *extensive* agricultural techniques is a viable alternative. More labor must be invested in farming larger or more fields than before, but the overall cost is not extremely high. If the distribution of land resources or population precludes switching to more extensive agricultural techniques, migration to an unused portion of the local region is a somewhat more expensive alternative. This type of movement can entail a large initial investment of labor, but in the long run, farming costs will remain at nearly the same level as before. If none of these options are open, it may become necessary to develop more *intensive* agricultural techniques to increase production without requiring new territory or access to resources that are already heavily competed for. The cost involved in intensifying agricultural production will vary depending upon the technique selected. When construction and maintenance costs are considered, this is likely to be the most expensive option available at the local level.

This sequence of options is not necessarily linear. Rather than intensifying the agricultural system, a population might choose to combine a slightly higher dependence on wild foods with a somewhat more extensive agricultural system, thus cutting labor costs while temporarily solving the food resource/population imbalance. Rather than migrating within the local region, a group could choose to intensify their agricultural techniques. Intensification can also be combined with more extensive agricultural techniques, resulting in water- and soil-conservation systems in association with seasonally occupied field structures. Thus, the solution to a food resource/population imbalance is often not as simple as the model suggests.

Two other mechanisms for relieving stress should also be mentioned. The first is redistribution of the population on a temporary basis through alliance networks. This can entail temporary displacement of part or all of the local population by exploiting ties with groups that are not enduring the same difficulties. Kin ties, friendship, exchange networks, or ceremonial relationships can be the basis for such movement. This is a temporary solution to the problem, in which the affected group leaves home for a season or more but returns when conditions improve. This sort of remedy can help alleviate short-term stress, but it is ineffective against long-term or permanent imbalances. The final solution is movement to a wholly new region. This type of migration requires considerable work. Not only do new homes need to be built and farmland cleared, new alliance and exchange networks must also be established. At times these tasks may have to be completed in the face of hostile locals resentful of the unfamiliar element in their midst.

As examples of more intensive agricultural techniques, water- and soil-conservation systems not only indicate not the types of stress affecting a population, they also point to the options that are no longer open. When such systems are constructed, the options to fall back on hunting and gathering, use more extensive agricultural techniques, move to another location within the local region, or use alliance ties to redistribute population are either closed or in use but are unable to counter the imbalance.

The presence of check dams and naturally filled contour terraces implies that an area was being eroded. In the case of check dams, this is obvious. Since this type of feature was constructed across active drainage, erosion was necessarily at work. The natural filling of contour terraces implies downslope soil movement, again indicating active erosion. Check dams are the most frequent water- and soil-conservation features noted at the Gallo sites, and contour terraces are the next most common. Since there were no indications of artificial fill in any of these features, it is probable that they were constructed during a period of active erosion.

Diversion walls, which may have functioned as channel-switching devices, were defined at LA 14915, LA 14918, and LA 14919. Field analysis suggested that these features controlled the distribution of water to terraced fields in more than one subsidiary drainage. However, the location of individual features in relation to erosional channel patterns suggests a simpler and more likely explanation. In each of these cases, the controlled drainage splits above a check dam. The centers of several check dams have also been removed by erosion. This process occurs when excessive runoff removes soil from the base of a dam, causing it to collapse (Sandor 1983), and is probably evidence of bad engineering. The use of diversion devices to channel excess runoff away from the dams can prevent this from happening (Sandor 1983). Did these features serve as diversions to control water flow through the system, or were natural formation processes at work?

A problem often associated with check dams is shifting of the drainage channel around a feature, creating a new gully. At OCA:CT:76, near Thoreau, New Mexico, a check dam of uncertain date caused the gully it was constructed across to shift, cutting through one end of the feature (Miller and Frizell 1980). Three check dams noted near BAN 10 at the edge of La Bajada Mesa had been built across a shallow erosional channel (Moore and Harlan 1984). Those features became isolated when the channel shifted around the system. Numerous historic check dams in the middle Rio Puerco Valley have been rendered useless by the same process. Erosion was checked for a while, but the drainage eventually shifted around the obstructions and resumed downcutting around the dams.

In addition to acting as channel-switching devices, there are two other possible explanations for these features. The secondary gullies could have been intentionally created to carry excess runoff away from the check dams and prevent erosion, or they could have resulted from excess runoff seeking the path of least resistance and forming a new channel. The latter is visible at LA 14915, where the gully has split around Feature 9, creating a new channel. The main difference between this example and those in which the use of channel switching devices is suggested is that the new channel rejoins the old one several meters downstream.

If the diversion of gullies around check dams to prevent erosion was intentionally attempted, certain attributes might be expected. Similar features at the Desha Creek Community in southern Utah were carefully prepared to prevent further erosion (Lindsay et al. 1968). Several contour terraces and check dams at that site were outletted to remove excess runoff, and the ditches that transported the runoff were lined with stone when they ran downslope to prevent development of new gullies. If the channels that cut around check dams at the Gallo sites were intended to remove excess runoff from the system, they were very haphazardly designed--there is no evidence of stone lining in any of the new channels. Unlined ditches could have removed excess water from the systems, but they would also have caused the adjacent hillslope and valley bottom to begin eroding again, essentially restarting the process they had been created to halt.

It is more likely that the diverted gullies were created by natural processes rather than having been intentionally built into the systems. The design of Feature 5 at LA 14915 and Feature 3 at LA 14919 supports this idea. In both cases, the original check dams seem to have been extended across the new gully to slow the flow of water. Feature 6 at LA 14915 was constructed across the new gully and appears to have redirected flow in yet another direction. At LA 14919 the sequence of channel cutting and feature construction can be reconstructed. The southernmost channel was probably the original drainage. It is likely that individual features were constructed from the bottom of the system up rather than downward or all at once. This would permit each dam to fill completely rather than causing the lower features to fill slowly or not at all, because most or all of the soil was being deposited in higher dams. The central gully probably formed when flow diverted around a check dam in the original system. Check dams were then constructed across that channel to prevent further gullying and to trap soil and form new agricultural terraces. The northernmost channel was formed at a later time, when water flow diverted around another check dam higher in the system, and it was similarly treated.

Thus, check dam systems were probably always changing while they were in use. The continual risk of damage from excess runoff or diversion of a channel around the features had to be countered. Excess runoff could destroy the system and its associated agricultural plots. Diversion of flow into a new channel indicated that the process the dams had been built to correct was once again in action, and the supply of soil and water being delivered to the existing terraced plots was severely decreased. The use of such agricultural techniques was a dynamic process, in which repairs to old systems and the construction of new or subsidiary systems occurred all the time.

Though the check dams that were originally defined as channel-switching diversion walls do not seem to have functioned in that way, a feature at LA 14918 does appear to have been used to redirect runoff within that system. Feature 3 is a L-shaped wall in which the longer leg dams a gully and the shorter leg runs down the hillslope parallel to the channel. This feature is similar to those recorded by Rodgers (1978) at La Boca Negra Park near Albuquerque. Diversion walls were associated with two agricultural systems in that area, channeling water into agricultural plots as well as out of them. The diversion wall appended to Feature 3 at LA 14918 may have directed excess runoff onto an adjacent hillslope to provide water for an agricultural plot or channel it out of the system. Feature 3 at LA 14919 may have functioned similarly, diverting water away from a rock/cobble outcrop or correcting a natural diversion of the drainage around a check dam.

The function of the dams at LA 14463 remains undetermined. They may have been built across an arroyo channel to slow downcutting and trap soil and water, creating agricultural plots. However, it is also possible that they were built to divert water from the arroyo into a canal or ditch for transport to fields. Unfortunately, excavations were unable to verify the existence of a canal or ditch at this site, so it is not possible to determine whether the dams acted as erosion control devices or diversion dams. Since no evidence of a culturally constructed channel was recovered, the former is most likely.

Several features defined at LA 14913 were never archaeologically verified, including a contour terrace wall (Feature 2) and two gridded garden plots (Features 4 and 5). Since the agricultural nature of these features was never demonstrated, and the surface remains were tenuous, the presence of grid gardens in the project area remains unverified. The agricultural features at this site were probably relatively simple: a check dam and one or two contour terraces.

The existence of a headgate at LA 14916 is similarly doubtful. It is more likely that the upright slabs in that feature were isolated by erosion rather than purposefully placed to control water flow from behind the dam. Not only was that feature too small to have effectively impounded water, there was no reason to have done so in that location. Headgates are usually associated with canal and ditch systems where the flow of water to fields must be regulated, not with small check dams in intermittent drainage. If headgates were built into terrace-type systems they would be expected to follow the pattern described by Rodgers (1978) in similar features at La Boca Negra Park. There, headgates consisted of simple breaks in contour terrace walls that allowed excess runoff to flow out of a system. Since check dams silt up rapidly (Moore 1981), headgates in such features would be of little use.

Only check dams were present at LA 6076 and LA 14912. Since the presence of channel-switching diversion walls has been discounted, most of the features present at LA 14915, LA 14918, and LA 14919 are also check dams. A similar functional assignment for the single feature at LA 14916 can also be made. Contour terraces occur at LA 14913 and LA 14915. As stated earlier, these types of water- and soil-conservation devices capture and hold soil, preventing it from eroding away. At the same time, they slow the velocity of runoff, allowing more water to percolate into the soil and increasing the supply of moisture available for agriculture.

Most of these systems are rather simple in construction techniques and function. The only exceptions to this may have been LA 14463 and LA 14913. If the dams at LA 14463 diverted water from an arroyo into canals or ditches, that system displays a sophistication in waterworks that is not seen elsewhere in the Gallo area. Unfortunately, these features were situated across an intermittent drainage. The supply of water in such a location is both sporadic and unpredictable, factors that argue against the presence of a canal or ditch. True irrigation systems require a predictable water supply. It is more likely that these features were check dams constructed to stop or control erosion and that LA 14463 was similar in function to the other investigated sites.

The apparent sophistication of features at LA 14913 may be illusory. There is no hard evidence for the gridded plots noted during investigation of this site. No actual alignments were recorded, only shallow depressions that may or may not be the remains of agricultural features. It is more likely that these depressions were natural features of the hillslope rather than constructs of cultural derivation. Without definite evidence to the contrary, it must be concluded that the water- and soil-conservation system at this site was also relatively simple.

Dating of Features and the Ecological Implications of Water- and Soil-Conservation Systems

Dating most water- and soil-conservation systems is an almost impossible task. Few features contain cultural fill or have temporally diagnostic artifacts in association. Even when dateable artifacts are present, their association with the water- and soil-conservation features is not always clear. Though they could have been deposited when the features were built or used, it is also possible that they were left behind during a later occupation or were washed in from an earlier site. In many cases water- and soil-conservation features are assigned dates based on those of nearby residential sites or an investigator's familiarity with a region. Only occasionally is it possible to assign relatively accurate dates to water- and soil-conservation systems. Contour terraces in the middle Rio Puerco Valley of north-central New Mexico were artificially filled with trash from nearby sites and concluded to have been constructed sometime after the beginning date of the latest ceramic types recovered (Moore 1981). Although an exact construction date was not available from such information alone, an accurate approximation was derived.

Temporal information is rare at the water- and soil-conservation sites investigated near Gallo Mountain. Ceramics dating to the Reserve and Tularosa phases were recovered from deposits behind and between the check dams at LA 6076. Trash deposits associated with the nearby residential features probably accounts for their presence. Though a definite construction date cannot be assigned, it is likely that these features date to or slightly later than the Reserve and/or Tularosa phases. Reserve phase ceramics were also found on the surface in apparent association with the check dams at LA 14913. Since no excavations were conducted, no artifacts of demonstrable association with the check dams were recovered. While it is possible that the surface ceramics were deposited during the period in which the site was used, it is just as likely that they date to an earlier or later occupation of the area. Therefore, only a very tentative date can be assigned. Temporally diagnostic materials were found at no other water- and soil-conservation sites. Kayser (1976) and Kayser and Dart (1977) felt that these features dated to the Reserve and/or Tularosa phases (A.D. 1000-1350), the last 350 years of Mogollon occupation. For reasons that will be discussed later, these dates are probably accurate.

Sandor (1983) has completed an intensive study of water- and soil-conservation systems in the Mimbres area, and many of his observations and conclusions are of relevance to this discussion. Sandor's sites were located near the Mimbres and Sapillo Valleys of southwestern New Mexico at elevations ranging between 1,900 and 2,000 m. All were concluded to have been constructed and used during the Classic Mimbres phase. Contour-terrace and check-dam systems were analyzed, and the average site contained 3-10 features. Contour-terrace systems were most common and contained walls measuring 1-50 m long. Check-dam walls measured 1-10 m long. In several instances, water- and soil-conservation systems contain both types of features. Sandor (1983) feels that these systems supplemented irrigated valley-bottom fields, but evidence for irrigation was not documented in his study.

Soil moisture studies were inconclusive but suggest that there was a trend toward increased moisture levels in the terraced plots in comparison with unterraced areas (Sandor 1983:87). The terraced plots probably met the water requirements for agriculture, particularly since there are indications of higher than average amounts of precipitation during the proposed period of use. The concept that the gullying of slopes was caused by terracing and accompanied the removal of the natural grass and rock cover is intriguing (Sandor 1983:103). Diversion features that would channel excess runoff away from the plots could have helped prevent gullying, but they do not appear to have been used. The discovery of low-organic-matter levels in the terraces, compared to modern cultivated soils, was considered surprising in view of the long period of abandonment (Sandor 1983:220-223). Two possible reasons for this were considered: reestablishment of the vegetative cover necessary to restore organic levels to those preceding cultivation did not occur because of climatic conditions; or long-term soil degradation could have been aggravated by conditions initiated during cultivation. Phosphorus levels were also found to be much lower in the terraced plots than in control plots, implying that the prehistoric farmers did not use fertilizer. The loss of organic matter and nutrients as well as compaction of the upper soil horizons probably contributed to the subsequent gullying of slopes (Sandor 1983:260).

Sandor's tests demonstrated that the plots created by construction of contour terraces and check dams were suitable for agricultural use. Feature placement was deliberate with respect to climatic, topographic, and soil factors. Systems were placed on gentle slopes and within small drainages to avoid excessive runoff from heavy storms and take advantage of the greater frequency of runoff velocities by decreasing the angle and length of slopes. These systems trapped runoff for crops and thickened the soil horizon for moisture storage and rooting needs (Sandor 1983:259).

From data that includes soil-depletion figures and tree-ring-derived climatic information, Sandor concludes that the terraced fields were cropped for a period of 50-150 years. Fieldhouses were located near most of the water- and soil-conservation systems, and they probably date to the final period of the Mimbres occupation.

The suggestion that the systems themselves caused gullying is thought provoking. If clearing stones and vegetation from slopes to facilitate construction of agricultural features and cultivation results in gullying, as Sandor asserts, then use of many water- and soil-conservation systems may have actually exacerbated the process they were constructed to arrest. Slope deterioration continuing to the present day may, in some cases, be a result of prehistoric agricultural techniques. Terraces in the Mimbres area were probably short-lived, since fertilizer does not appear to have been used to replace the nutrients removed by crops. Continued deposition of sediments by runoff may have helped offset this process to a certain extent, but in the long run, it was probably not sufficient to permit extended use. This is comparable to soil conditions at gravel-mulched grid gardens in the Chama Valley. Soil tests at agricultural features near Medanales indicate that prehistoric agriculture had similarly depleted organic matter in the soil (White 1986). Agricultural features like those investigated near Gallo Mountain would have proven to be short-term solutions to the problem they were constructed to counter. Not only did they have a limited life as fields in the absence of supplements for the nutrients removed by cultivation, they may have actually accelerated erosion and caused more damage than they managed to stop.

Reasons for Construction

At the outset of this section, a model adapted from Moore (1981) explaining the use of water- and soil-conservation systems was discussed. Construction of such systems was presented as one of a series of options for adapting to a food resource/population imbalance. The cause of this imbalance is difficult to specify, but the possibilities include climatic shift, population growth, environmental degradation, or a combination of some or all of the above.

A combination of all three variables may have been at work in the Mimbres area, leading to construction of water- and soil-conservation systems and eventual collapse of the organizational system. During the Classic Mimbres phase (A.D. 1000-1150) there were radical changes in social and architectural patterns. Sites were hierarchically distributed by size, but no element of control by those uppermost in the hierarchy is suggested (Minnis 1981; Anyon 1984). Sites of 100+ rooms were situated in the vicinity of the best agricultural land. Medium-sized sites of 20-75 rooms, considered colonies of these larger sites, were situated adjacent to slightly less suitable land. The smallest sites, ranging from 1 to 15 rooms, occur in upland locations and lack the communal or ceremonial structures that occur on larger sites. The use of these small upland sites represented a reoccupation of areas that had mostly been abandoned as residential and agricultural zones after

A.D. 550. Gilman (1980) indicates that a similar hierarchical arrangement occurs in the regions north and east of the Mimbres area. However, the largest sites in those regions were rarely larger than 40 rooms. Mechanisms of village integration also underwent change at this time, and a distinct pattern of private and public ritual space emerged (Minnis 1981). These trends are suggestive of population growth and, as Stuart and Gauthier (1981:201) state, most sources agree that this time period was one of substantial population increase.

Climatically, there is some evidence for variation during this period, but it is uncertain what the relationship between climatic change and the construction of water- and soil-conservation systems might be. There is evidence for a climatic regime unusually favorable for agriculture during the first two-thirds of the Classic Mimbres period, with precipitation patterns deteriorating during the last third (Minnis 1981). Most of the population expansion probably occurred during the favorable first two-thirds of this period. The less favorable climatic regime may have initiated a food resource/population imbalance by decreasing crop yield, forcing expansion into less agriculturally favorable zones. Continued stress could have necessitated the construction of water- and soil-conservation systems to aid in countering agricultural shortfalls as well as repairing or preventing erosional damage to agricultural land. Conversely, these trends could have begun in the more favorable period because of the large increase in population. In that case, the construction of water- and soil-conservation systems may have been symptomatic not only of environmental damage resulting from residential and agricultural use. It may have accelerated the process, particularly when the climate changed for the worse.

Substantial environmental change is reflected in the archaeological record of the Mangas Valley (Van Asdall et al. 1982). Flotation analysis indicates that extensive use of the floodplain for agriculture caused erosion and lowered the water table. Farming was not as productive as it had been before the Classic Mimbres period, as evidenced by a decrease in the amount of maize recovered during excavation and a concomitant increase in the amount and diversity of wild plant food. Throughout the region there are indications that reliance on smaller and more diverse animal species was increasing at this time, and the use of larger species was declining (Stuart and Gauthier 1981). Not only do these data suggest that the region was undergoing environmental change, they also indicate that the population was attempting to adjust to a food resource/population imbalance by increasing their reliance on wild foods. It is probably no coincidence that the first evidence of agricultural field modification appeared at that time (Minnis 1981). Since fieldhouses or dependent farming villages were also established in the highlands during the Classic Mimbres period, it is probable that a mixed approach was being pursued, which included increased reliance on wild foods, more extensive farming patterns accompanied by seasonal population shifts, and the construction of water- and soil-conservation systems to save or create new farming plots and supply water to previously unfarmable areas.

Similar trends appear to have been at work in the Chacoan interaction sphere. The late Pueblo II and early Pueblo III periods saw the greatest extension of the Chacoan systems within the San Juan Basin and was probably accompanied by the highest population density of the prehistoric period in that region. Like the Mimbres area, the San Juan Basin may have undergone a period of high precipitation and warm summer temperatures between A.D. 900 and 1100. This was followed by a period of summer drought lasting until around A.D. 1180 (Gillespie 1985). Numerous investigators have located and described water- and soil-conservation systems in and around the Chaco Canyon area (Hewett 1905, 1936; Holsinger 1901; Lagasse et al. 1984; Loose and Lyons 1976; Lyons et al. 1976; Turney 1929; Vivian 1970, 1972, 1974). Vivian (1974) suggests that the development of water- and soil-conservation systems occurred after A.D. 900 and was associated with a period of erosion linked to summer-dominant rainfall patterns. However, Cooke and Reeves (1974) indicate that the process of arroyo cutting is linked to more than one variable, including a change in erosion patterns through vegetational change, weakening of soil structure, the masking of vegetation and soil by sediments, an increase in slope or hydraulic radius resulting in increased erosiveness of flow, and/or the reduction of surface roughness. Thus, a decrease in the vegetative mat caused by overexploitation of wild plants for food and firewood or excessive clearing of agricultural lands could also lead to accelerated erosion and arroyo cutting. In short, it appears that the human population was growing while the environment was sustaining damage that caused its productivity to decrease. The development of water- and soil-conservation systems is probably linked to these trends.

Similar trends also appear to be visible in the data from the San Juan region. In parts of this region that were occupied during the Pueblo III period (A.D. 1100-1300), Nickens and Hull (1982) recognize two demographic peaks: the first around A.D. 900 (Ackmen phase), and the second after A.D. 1100 (McElmo and Mesa Verde phases). While the first peak occurred in several districts, the second appears to have been restricted to the Mesa Verde district and southwestern portions of the Yellowjacket district (Nickens and Hull 1982). Hayes (1964) indicates that average site size on Wetherill Mesa is greatest during the McElmo (A.D. 1050-1150) and Mesa Verde (A.D. 1150-1300) phases. Though Hayes suggests that there was a continuous population decrease in that area after it peaked during the Ackmen phase (A.D. 900-975), Mesa Verde phase sites are small and situated in scattered locations, trends that Hayes (1964) links to increased population pressure and a need for new farmlands to augment those that had been used for centuries.

Environmental deterioration was occurring as the population grew. Pollen studies by Martin and Byers (1965) and Wyckoff (1977) are suggestive of this process. Palynological samples from check dams on Wetherill Mesa yielded corn pollen, indicating agricultural function, and also demonstrated that *Zea* and *Cleome* (possibly a cultigen or invader of economic importance) pollen decreased in later deposits, while arboreal pollen increased (Martin and Byers 1965). Wyckoff (1977) examined pollen samples from Mummy Lake and concluded that low percentages of arboreal pollen in the lower levels of excavation demonstrated that very little forest cover was present just before abandonment of the area. Increases in arboreal pollen concomitant with decreases in nonarboreal pollen densities in later samples are interpreted as evidence of secondary forest succession following abandonment. Studies of fuelwood consumption in the Dolores area also seem indicative of this process and suggest that Anasazi farming and fuel-gathering practices substantially decreased local woodlands (Kohler and Matthews 1988:560). Long-term disturbance of forest cover for construction materials and fuel in addition to heavy farming of the mesa tops resulted in erosion. This is confirmed by the presence of numerous check-dam and contour-terrace systems on Wetherill and Chapin Mesas (Hayes 1964; Rohn 1977). Excavations behind check dams on Wetherill Mesa revealed water-laid deposits, indicative of this process (Hayes 1964; Martin and Byers 1965). Final abandonment was probably linked to environmental deterioration resulting from agricultural and residential usage, exacerbated by the Great Drought of A.D. 1276-1299. While more severe droughts had occurred at earlier times, this one struck at a time when the subsistence system was already under stress, creating conditions that the populace could not adjust to.

The construction of water- and soil-conservation systems can be linked to multiple variables, including population growth, environmental deterioration through agricultural and residential usage, and in at least two of the above three cases, a climatic regime favorable to population increase and expansion into previously unsuitable agricultural zones, followed by a period of reduced precipitation. Destabilization of the environment appears to have contributed to erosion, which in turn was countered by the construction of conservation-oriented features. In the Mimbres area, supplemental systems in the form of canal-irrigated fields were also constructed to increase agricultural production.

How do these areas compare to the Gallo Mountain region? Unfortunately, little detailed information is available. The few data that exist suggest that similar trends may have been occurring at Gallo. Most water- and soil-conservation systems recorded in the region contain conservation-oriented features built to slow erosion and collect soil and moisture that would otherwise have been lost. These features also helped protect farmlands at the base of slopes by slowing the runoff velocity and reducing the potential for gullying.

These types of features indicate an erosional regime. Culturally caused environmental deterioration may have been a major factor in this process, but this is impossible to state for certain. Most water- and soil-conservation systems are dated to the Reserve and/or Tularosa phases (A.D. 1000-1350). Danson's (1957) survey showed that sites were fewer but much larger during this period than they were at any earlier time. This suggests that demographic patterns were similar to those of the other areas discussed, including a period of substantial growth between A.D. 900 and 1000 or 1100, and a peak after A.D. 1100. There was a movement toward lower elevations similar to that occurring in the Mimbres region, and the large, late pueblos were on benches and ridges above farming land in the lower valleys. The presence of small farming communities associated with water- and soil-conservation systems at relatively high altitudes during the same time period is also similar to trends occurring in the Mimbres region. The combination of an expanding population and limited agricultural lands in the lower valleys probably forced an expansion into less agriculturally suitable areas.

Lacking environmental information, a closer comparison of the Gallo region with those discussed above is not possible. Tree-ring data (Dean and Robinson 1977) suggest a tremendous fluctuation in moisture levels throughout this period, but tree-ring widths are more indicative of winter than summer precipitation, so little can be said concerning the amount or reliability of summer precipitation. However, the growth in population essentially mirrors that of the other areas discussed, and the fact the Gallo region is situated between two areas that experienced a favorable summer precipitation regime through most of this period suggests that similar conditions may have prevailed.

Conclusions

A number of topics concerning why water- and soil-conservation systems were built and how they functioned have been discussed. The distribution of these systems was cursorily addressed, focusing on the Mogollon region. A wide variety of water- and soil-conservation features occur throughout the Anasazi, Mogollon, and Hohokam portions of the Southwest (Moore 1981), with contour terraces and check dams among the most commonly occurring forms. The presence of naturally filled contour terraces and check dams is indicative of erosion. If the environment was not deteriorating, there would be no need for such features. The presence of these types of water- and soil-conservation systems suggests that the resource undergoing stress was agricultural land. Not only do check dams and contour terraces help stabilize or trap soil that would otherwise be washed away, they also slow runoff velocity, allowing more water to percolate into the soil. This can help reduce or prevent erosion of fields lower in the watershed.

Most water- and soil-conservation systems appear to have been built during periods of maximum population density. In many cases they accompany or postdate expansion of the agricultural system into zones that are less suitable for farming. As the vegetative cover was reduced by agricultural and residential use, erosion appears to have occurred. Summer-dominant precipitation patterns may have contributed to this process, and annual fluctuations in precipitation probably exacerbated the situation. Evidence from the Mangas Valley (Van Asdall et. al 1982) suggests that agricultural lands were being eroded when the population was attempting to increase food supply by exploiting more wild plants and animals. Population redistribution on a local level was probably not feasible because there were no nearby areas that were not already being used. Any available zones were already being exploited by the use of more extensive agricultural techniques including temporary shifts to fieldhouses or seasonal farming communities. Thus, around the time water- and soil-conservation systems were being constructed to help intensify the food-procurement system, no other local options were available. Minnis (1981) suggests that yet another option would have been to increase the Mimbres economic network with areas outside the immediate region. This was never done, and failure to pursue this option may have been a major contributing factor to the eventual collapse of the Mimbres culture.

The water- and soil-conservation systems investigated during this project were of relatively simple construction, but their implications are far more complex. The types and locations of systems used indicate that the region was undergoing an erosional regime at the time of construction. Since the choice was made to intensify the agricultural system, it is likely that less labor-intensive solutions to the food resource/population imbalance were no longer viable. Either they were already in use, or the organizational system did not permit them to become a solution. There is no evidence of large-scale cooperative ventures. These are small-scale systems aimed at halting erosion in restricted areas. It is likely that they were the work of family or lineage units. In other areas this is suggested by the association of small field structures with individual water- and soil-conservation systems (Moore and Harlan 1984). Sandor's (1983) work on agricultural terraces in the Mimbres region suggests that not only was the construction and use of these systems a temporary solution to the problem, they may also have accelerated the processes they were constructed to halt. This is evident in the features investigated by this project. Several check dams were eventually eroded through by the gullies they were built to stop. In some cases, check-dam construction caused the diversion of erosional channels, resulting in the gullying of adjacent parts of the slope. This process had to be corrected by constructing more dams in the new channel.

The construction of these systems demonstrated a detailed knowledge of the prehistoric environment and an understanding of the principles of erosion and the benefits that would accrue by stopping it. Unfortunately, there was a lack of familiarity with many of the farming and engineering principals necessary to make this a long-term solution to the problem. Had the fields been fertilized and devices designed to carry excess runoff out of the systems been used, it is possible that these rather simple hydraulic features would have been considerably more effective over the long run.

ARTIFACT RECOVERY

Artifact collection procedures undoubtedly influenced the assemblages recovered from the Gallo sites. The ratios of ceramics, lithic artifacts, ground stone, and bone helps to identify sites where the distributions may be determined more by collection procedures than site function (Table 100).

As expected, the scatters tend to have few artifact classes represented. Ceramics, ground stone, and bone are generally sparse or absent. LA 6074 is an exception. The sherd/lithic ratio is similar to that of the habitation sites except that it has no other artifact classes. This most likely results from the small sample size (12 sherds and 2 lithic artifacts). Similarly, LA 6077 was only surface-collected and produced a small artifact assemblage (8 sherds and 11 lithic artifacts).

Possible fieldhouse sites produced few artifacts, and none had representatives of all artifact classes. One fieldhouse site had bone, and one had ground stone.

Habitation sites and the trash from a habitation site (LA 14908) were more diverse, partially because of more extensive excavation at these sites. Assemblages from these sites may be affected by individual site collection procedures. LA 14908 was the most divergent of the residential sites. In particular, the assemblage lacks ground stone and bone. Since the percentage of weathering in the bone recovered was similar to the that from other Gallo sites, preservation alone should not account for this difference. Two possible explanations are selective dumping of sherds and lithic artifacts by the site occupants or poor collection by the excavators.

The proportion of ceramics to lithic artifacts is fairly consistent, ranging from 3.5 to 7.7. LA 14858 is unusual, with 22.4 sherds per lithic. In addition to having fewer than the average number of lithic artifacts, those recovered are largely tools (Wening, this volume), suggesting a bias toward collection of larger objects. The number of bones from this site is relatively small, but given the shallow fill and the large amount of weathered bone (73.2 percent), the lack of bone at this site could result from poor preservation.

The ratio of sherds to ground stone is relatively constant (26.3:1 to 39.0:1) except for LA 14908 and LA 14909. The other artifact ratios for LA 14909 are closer to those for the other habitation sites. Ground stone was probably more difficult to recognize at the hillside structures, where much rubble was found. However, this was not the case at the third hillside structure, LA 6076, and may result from collection practices at LA 14908 and LA 14909.

As for bone, the only site that deviates significantly is LA 6076. Bone recovery at this site was particularly bad. The percent of weathered bone is typical of the Gallo sites, and the large amount of bone recovered in the flotation samples further argues against preservation as the primary factor.

Screening of only the floor and floor fill proveniences tend to affect recovery of some types of artifacts more than others. Large items, such as ground stone and sherds, are more readily recovered from the unscreened trash than small bones or lithic artifacts. Because so little screening was done, and there are indications that at least some artifact types were not consistently collected, it is difficult to reach conclusions based on artifact distributions.

SITE DATING

Few absolute dates have been assigned to the Gallo sites. Table 101 gives four views of the dates for the ceramic wares found at the sites. The following discussion is based on these suggested dates, recognizing that ceramic dating is imprecise, and these are, at best, estimates.

LA 5407

LA 5407 is the best dated of the Gallo sites. Nine dates from dendrochronological samples cluster between A.D. 515 and 517 (+r) (HWS - 49, 51, 52, 59-62, 64, and 66). One radiocarbon sample (Beta 28743) taken from burned beams stored in foil, Feature 39, dated A.D. 250 ± 60, adjusted date A.D. 235 ± 60. Another radiocarbon sample (Beta 28744) from a burned beam stored in foil, Feature 25, dated A.D. 500 ± 50, agreeing with the dendrochronological dates.

LA 5407 has few ceramic types represented: Alma Plain, Alma Smudged, Mogollon Brown, San Francisco Red, and San Francisco Red Smudged. LeBlanc (1982:111) dates true San Francisco Red at not before A.D. 550. The LA 5407 dates suggest a slightly earlier date. Otherwise, the site dates are within the recognized range for those wares.

LA 6075

There are no absolute dates for LA 6075. Neither of the two dendrochronological samples submitted could be dated, and no radiocarbon samples were collected. Few of the ceramic wares suggest an early component at this site. The San Francisco Red (n=7), Alma Textured (n=3), and Reserve Smudged (n=16) are early wares but co-occur with later wares at this site. The more common and diagnostic wares suggest a date between A.D. 1100 to 1150 and A.D. 1200 to 1250.

LA 6076

LA 6076 is informative because it has superimposed structures. Feature 60 is overlaid by a larger room, Feature 29, and was disturbed by a later pit structure, Feature 28. Two dendrochronological dates from Feature 60 (HWS-68: 1028p-1077r; HWS-67: 1028p-1085+r) suggest construction in the late A.D. 1000s. A sample from Feature 29 dated 990fp-1082vv (HWS-72) and one from Feature 28 at 1044fp-1101vv (HWS-77). Other dendrochronological dates from the site are from Feature 57 (HWS-73: 762-897vv; HWS-74: 1034fp-1089vv) and Feature 58 (HWS-78: 1030p-1090vv). Nineteen samples did not date.

Three radiocarbon samples were submitted from this site. The first, from the floor fill of Feature 41, was burned wood that had been wrapped in string and stored. The uncorrected date of A.D. 1250 ± 50 (Beta 28740) is possibly a little late. Another sample, from the floor and features of Feature 29, is burned wood stored in foil. The uncorrected date of A.D. 990 ± 70 (Beta 28741) is early given the dendrochronological dates and the location of Feature 29 over Feature 60. The third sample, burned wood stored in foil, was from the roof fall in Feature 60. The uncorrected date of A.D. 1130 ± 50 (Beta (28742) is within the range suggested by the dendrochronological samples.

Ceramic wares from this site suggest there was little time difference in the occupation of the earlier and superimposed structures. More suggestive of a difference is the proportion of gray wares in the two assemblages. With the exception of Reserve Smudged, which is found so consistently throughout the site, suggesting that it dates later than Table 101 suggests, the wares found in the earlier and later rooms are fairly consistent in date. The dendrochronological dates suggest a beginning occupation around or just after A.D. 1100. The ceramics suggest it lasted into the A.D. 1200s.

LA 14858

There are no absolute dates for LA 14858. The single dendrochronological sample submitted did not date. LA 14858 has a wide variety of sherd types present. None of the earlier dating wares (Kiatuthlanna Black-on-white, San Francisco Red, or Alma Punched) were from deep in the structures, and nearly all of the structures contained at least one of the later wares (Tularosa Black-on-white, Mimbres Black-on-white, or St. Johns Black-on-red). The absence of St. Johns Black-on-red and near absence of Indented Corrugated in the pit structure (Feature 16) suggest it was abandoned before the rooms, possibly in the mid to late A.D. 1000s. The rooms with St. Johns Black-on-red in the assemblage would have been occupied until at least A.D. 1170.

LA 14882

There are no absolute dates for LA 14882. The ceramics suggest a date around A.D. 1050. Reserve Plain Corrugated is the most common utility ware with Reserve Indented Corrugated about half as prevalent. Only one sherd dates later than A.D. 1170 and it was probably intrusive.

LA 14906

No absolute dates were obtained for LA 14906. The ceramic assemblage is principally comprised of early wares (Alma Plain and San Francisco Red) plus a few Reserve series wares and a single red-on-brown sherd. The dates for the main use of the site are probably similar to those of LA 5407. Additional use between A.D. 650 and 750 is suggested by the brown-on-red sherd, and between A.D. 1000 and 1200 by the Reserve Black-on-white and Reserve Plain Corrugated wares.

LA 14907

There are no absolute dates for this site, and the ceramic assemblage is small. The ceramic wares suggest deposition from prior to A.D. 1150 until after A.D. 1170, based on suggested ending dates for Wingate Black-on-red and starting dates for St. Johns Black-on-red.

LA 14908

Nor are there absolute dates for LA 14908. The ceramics are from deposits that represent a midden or a collapsed structure and indicate a considerable use-span or series of occupations. San Francisco Red, Alma Plain, and Reserve Smudged are rare but may indicate a pre-A.D. 950

occupation. The latest dating ware is Tularosa Black-on-white, which, combined with the absence of St. Johns Black-on-red, suggest that the occupation ended prior to A.D. 1170.

LA 14909

No dendrochronological samples were collected from LA 14909. However, three radiocarbon samples were dated. The first, burned wood stored in foil from the fill of Feature 8, has an uncorrected date of A.D. 880 ± 60 (Beta 28737). The second sample, from the fill of Feature 9, is also burned wood stored in foil. The uncorrected date is A.D. 670 ± 50 (Beta 28738). The final sample, burned wood stored in foil from Feature 15, has an uncorrected date of A.D. 1150 ± 50 (Beta 28739).

The majority of the ceramic wares date between A.D. 1000 and 1050 and around A.D. 1200. Few early wares were found, and those with late starting dates (Tularosa Black-on-white) are also rare. This may suggest an occupation that did not last much into the A.D. 1100s.

Summary

Table 102 summarizes the estimated dates for the Gallo sites. Two principal occupations of Largo Creek are indicated for the sites with ceramics. The earlier occupation dates around A.D. 520, and there is little firm evidence of reoccupation of the valley until the mid to late A.D. 1000s. The main occupation appears to concentrate between A.D. 1050 and 1150 but may have extended past A.D. 1200.

CERAMICS

Sherds from the Gallo project were analyzed in two major episodes. During the spring of 1977, Rosemary Talley and Valerie Plettenberg identified ceramics from the majority of the Gallo I sites. They began by sorting the sherds from a site into wares, series, types, and design styles. Worked sherds and ceramics artifacts were kept separate, and partial vessels were reconstructed. The existing classification of Rinaldo and Bluhm (1956) for the Reserve area ceramics was used as the framework for much of the analysis. Nonlocal black-on-white sherds were typed using ceramic manuals, standard type descriptions, the type sherd and vessel collections at the Laboratory of Anthropology, and personal communications with the laboratory staff. The analysts were unfamiliar with many of the types and suggested some reanalysis, especially of the unidentified black-on-whites (Talley n.d.).

Once an assemblage was sorted into types, the code number, number of sherds, and vessel form were recorded on a ceramic type form. This information, except for the vessel form, was then transferred to feature sheets used to construct tables of counts. Because the analysis took place during the excavations, the tables were by feature number and level. Ceramic vessels and artifacts were described and measured.

Time did not allow the analysis of all sites or the tabulation of some that had been analyzed. Other than a few remarks on the methods used (Talley n.d.), descriptions of the wares from LA 5407 (Talley, this volume) and brief comments on the assemblages from LA 6074, LA 6075, LA 6076, LA 6077, and LA 14858, no reports were written.

The second round of analysis was done by Sandra Rayl (n.d.). Complete analysis was done on the assemblages from LA 14906, LA 14908, LA 14909, and LA 14910, and the painted wares from all sites were reexamined using a binocular microscope. Carlson's (1970) descriptions of the White Mountain red wares and Colton and Hargrave's (1937) descriptions of the black-on-white types served as a basic references. Reports concerning intrasite sherd distributions were written based on the tables compiled during both analyses (Rayl n.d.).

There are differences in the terms and subdivisions used for the unidentified wares between the two analyses. No attempt has been made to standardize these for this report. In the first analyses, "white ware" means the undecorated sherds from black-on-white vessels. White (or gray) ware groups followed by roman numerals are utility wares separated by surface treatment and temper. Group I was indented corrugated with wide corrugations (7 mm) and with sand and sherd temper. Group II was indented corrugated with narrow corrugations (4 mm) and with sand and sherd temper. Group III was indented corrugations with narrow coils and sand temper. Group IV was unslipped, unpolished plain ware with abundant sand temper, which was conspicuous through the surface.

Rayl uses the terms Cibola white ware plain, with carbon or with mineral paint; Pueblo II indented gray ware; and gray ware. Another difference is in the recording Alma Plain. Rayl assigned only rim sherds to this type, while the first analysis typed both rim and body sherds as Alma Plain.

Most of the sherds from LA 14882 could not be located during the first two analyses, and only a small number were analyzed. The main collection was found and the sherds identified by the author with the help of Sandra Rayl. The sherds identified in the earlier analyses could not be located.

All of the ceramic tables were rewritten for this report. Vessel form was added by going back to the original ceramic type forms and adding the information to the provenience forms. Unfortunately, this effort may have been futile, because inconsistencies in recording vessel form, particularly for the Plain Brown wares, are evident in several of the tables and occasionally in reconstructed vessels. Proveniences such as back dirt, unknown, or site area are usually not included in the counts. Features were divided into units consistent with the site structure.

Petrographic analysis was directed at two questions. The first concerned the two sites with fairly large samples of Alma Plain and San Francisco Red and the observation at the SU site (Martin and Darrow 1943:246) that these wares were made of the same or similar local clays and tempering materials. Samples of both types were analyzed to see if it was firing that resulted in the differences. The second concerned the changes in gray ware frequencies seen at several of the sites. Reductions in the percentages of indented gray wares correspond with what appeared to be an abandonment and reoccupation of at least some rooms at LA 6076 and at LA 14858. The sample was chosen to monitor differences in the temper of the Reserve Indented Corrugated and indented gray wares before and after this break.

The individual site reports concentrate on the presentation of the information available from the analyses. Site collection procedures preclude any but broad generalizations. The value of this analysis must rest on the cooccurrence of types and dating in an area that is largely unknown.

Petrographic Analysis of 30 Sherds from the Gallo Mountains

Elizabeth M. Garrett

Thirty sherds representing seven ceramic types collected from five sites (LA 5407, LA 14906, LA 6076, LA 14909, and LA 14858) located between 13 and 17.5 km south of Quemado on NM 32 were submitted for petrographic analysis (Table 103). These sites span from early to late times and include habitation and special-use sites.

This petrographic analysis was undertaken to determine the temper categories present in the sherds, describe the composition and maximum size of the tempering grains in each category, and to suggest, where possible, which of the ceramics were locally produced and which appear to be imported (Table 104).

Methodology

Prior to thin-sectioning, the sherds were numbered G1 through G30. Thin sections were prepared at the Geology Department, University of New Mexico, using standard geologic techniques. The sherd material was cut to size, ground flat on one side, then glued with epoxy to a glass slide. The ceramic material was carefully ground to a thickness of 30 microns, the correct thickness for examination with a petrographic microscope. A slip cover was applied over the ceramic material and the excess adhesive removed.

The 30 thin sections thus prepared were examined with a polarizing microscope in which light is forced to vibrate in two planes at right angles to each other. The light source is situated below the specimen, and when the polarizer is in place, the interference of these two light waves is expressed as color. When the polarizer is removed, the thin section may be examined in plane (that is, unpolarized) light. In addition, other optical devices on the instrument enable the geologic material to be identified and measured, and the angularity of the tempering grains noted.

Tempering material is added to raw clay to aerate the clay and avoid breakage as the water in the clay is heated to steam during the firing process. Most tempering material is of geologic origin, that is, crushed rock fragments, minerals, or loose sand. At times the temper is of cultural origin, that is, crushed fragments from previously fired ceramic items.

Where the tempering material is of geologic origin, it can be identified and compared to the geologic material occurring in the vicinity of the site from which the items under investigation were recovered. This information allows inferences to be made on whether the ceramics were locally produced or made elsewhere.

Clay minerals are too small (<0.0039 mm) to be observed with a polarizing microscope. More sophisticated analytical techniques such as X-ray defraction or neutron activation are required to analyze their properties.

The following data were recorded with an individual recording sheet for each thin section: (1) maximum size of the quartz grains, angularity of the grains, and interpreted origin of the quartz; (2) maximum size of feldspar grains: untwinned (usually orthoclase), twinned (usually plagioclase), or microcline; (3) maximum size of crushed-sherd fragments, if present, and whether they were originally from a painted or a utility ware; (4) the presence of chert; (5) the presence of ferro-magnesian minerals (e.g., hornblende, pryoxene, mica, magnetite); (6) the texture of the clay matrix when viewed in plane light, that is, an even, homogeneous appearance, or a thick-and-thin, uneven, mottled appearance; (7) the estimated amount, abundant or sparse, of the silt-sized material originally in the raw clay; and (8) the estimated percentage of the amount of tempering material added to the raw clay by the potter.

When the pertinent data for each of the 30 thin sections were recorded, the ceramic identifications and proveniences were added to the appropriate recording sheet. A comprehensive table containing all the raw data was constructed (Table 105).

Geology of the Site Area

The sites under investigation are at the interface between the Gallo Mountains to the south and the flat-lying plains to the north. The Gallo Mountains, which attain elevations of 2,720 m, are part of an extensive area of west-central New Mexico where a series of Tertiary pyroclastic flows covered the sedimentary shales and sandstones of the underlying Cretaceous Mesa Verde group. The rocks resulting from this extensive volcanic activity contain a variety of compositions: andesites, basaltic andesites, rhyolites, rhyolitic tuffs, latites, and conglomeritic volcanic sediments. These pryoclastic rocks are assigned to the Datil group. The rocks of the lower Datil group are, for the most part, in gradational contact with the rocks of the upper Baca formation. Stratigraphically above the Datil group are rocks composed principally of detrital volcanic material. Both the underlying Baca formation and the overlying Santa Fe group are, like the Datil group, of Tertiary age (Willard 1959).

The rocks present in the volcanic flows of the Gallo Mountains and the surrounding flat-lying areas reflect a variety of igneous compositions. There are latities, interlayered rhyolite and andesite flows, and conglomerates of pebbles and cobbles of a variety of rock types in which latite and andesite predominate. Typically, the lower flows are latitic and commonly grade into an overlying facies of rhyolitic tuff, which in turn is overlaid by, or interfingers with, an andesitic facies (Willard 1959).

In addition, nonvolcanic detrital fragments are present, probably derived from the sandstones and siltstones in the Quemado area. Outcrops of sandstone, siltstone, and conglomerates may be present throughout the area but are not always of sufficient thickness to be considered a facies (Willard 1959).

The Baca formation, stratigraphically below the Datil formation, contains arkose, sandstones, mudstones, and conglomerates. The latter is made up of rounded pebbles and cobbles of quartzite, chert, quartz, granite, and limestone. Lag gravels from the Baca formation are present from Pie Town to Red Hill (Willard 1959).

In the Datil group rocks, the andesites are porphyritic, commonly containing large lath-shaped phenocrysts of feldspar. Tufaceous sediments are similar compositionally to the latite facies, the textural differences reflecting a difference in distances from the volcanic vent and/or differences in the environment at the time of deposition of the igneous flow material. The latite is, in general, fine grained with phenocrysts of hornblende, biotite, plagioclase, sanidine, or quartz. The rhyolitic flows tend to be lenticular rather than continuous and contain phenocrysts of biotite, sanidine, quartz, and, rarely, hornblendes (Willard 1959).

Interpretation

Following the examination of the 30 thin sections and recording the appropriate information, the data sheets were sorted into five categories of tempering material (Table 106).

Sand-plus-volcanic rock fragments. This category of tempering material contained almost half of all the samples and is in five different ceramic types--San Francisco Red, Alma Plain, Reserve Plain Corrugated, Reserve Indented Corrugated, and Plain Brown Ware--recovered from each of the six sites under investigation.

Table 107 presents the petrographic data for each of the sherds assigned to this temper category. Many similarities are present. The tempering material is made up of angular to subrounded sand grains of quartz, untwinned feldspar, twinned feldspar, microcline, occasional chert, and occasional ferro-magnesium. The range in maximal size for the sand grains is minimal, from 0.3 mm to 0.6 mm, suggesting a well-sorted sand.

The rock fragments are angular basaltic to glassy basaltic in composition and range in maximum size from 0.6 to 2.5 mm, suggesting that this detrital volcanic material had undergone a relatively short period of transportation from its original source. The composition, sorting, and angularity of the sand grains and the volcanic rock fragments suggests collection of this tempering material from a fluvial source.

In addition to the composition and characteristics of the tempering material, a high degree of similarity in the silt-sized content of the raw clay, the texture of the clay matrix, and the estimated percentage of tempering material in all the sherds is evident. However, there is one major difference. The quartz grains in the San Francisco Red and Alma Plain exhibit characteristics denoting a metamorphic origin, in which the quartz crystals have undergone tectonic stress and acquired undulatory extinction. The quartz grains in the Reserve Plain Corrugated, the Reserve Indented Corrugated, and the Plain Brown wares exhibit straight extinction, denoting that the original source for the quartz had not been subjected to tectonic stress.

The San Francisco Red sherds appear to be quite similar, and even though they are from two sites, they share the same production center or the same collection area for ceramic raw materials. The two Alma Plain sherds are also similar to the San Francisco Red items and appear to have been produced, or the ceramic material collected, in the same locus.

The three utility wares--Reserve Plain Corrugated, Reserve Indented Corrugated, and Plain Brown Ware--contain quartz grains that exhibit straight extinction, thus pointing to a different origin from the quartz grains in the San Francisco Red and Alma Plain and different production centers for the earlier ceramic wares and the three later utility wares.

The degree of similarity of observed characteristics in the Reserve Plain Corrugated and Reserve Indented Corrugated strongly suggests that they share a collection area for the procurement of the raw materials for ceramic manufacture, even though the ceramics were recovered from three different sites. The Plain Brown Ware lacks chert. More examples of Plain Brown Ware should be examined to demonstrate that they were manufactured in a different drainage from that of the Reserve Utility items.

The composition of the sand in the vicinity of the sites is consistent with the sand-plus-volcanic-rock tempering material in some of the San Francisco Red and Alma Plain sherds. Binocular examination of a sample of sand from LA 5407 revealed that it consisted of the following: (1) silt-sized to fine-grained quartz grains; (2) coarse-grained, angular to occasionally rounded quartz grains; (3) coarse-grained, angular volcanic rock fragments of rhyolite to andesitic composition; (4) friable rock fragments of 3 to 4 mm consisting of silt-sized quartz and fine-grained volcanic rock fragments; and (5) silt-sized to fine-grained caliche grains. The alluvium is erosional material from the Santa Fe group, and the volcanic rock fragments are the erosional remnants derived from the Tertiary igneous flows in the area.

The compositionally different sand temper found in the Reserve utility sherds (Table 105) was collected from a drainage other than the one adjacent to LA 5407. The presence of Cretaceous sandstones and Tertiary volcanic rocks makes it highly probable that the sand containing the quartz grains with straight extinction was locally available elsewhere in the project area.

In the three Plain Brown Ware sherds, which also contain quartz grains with straight extinction, chert is absent, suggesting that this tempering material is from a drainage different from that where the temper for the Reserve utilities was collected. However, the area randomly chosen for thin-sectioning in these three sherds may have missed chert grains. A larger sample should be examined to determine whether or not chert is present.

Andesite rock fragments. This tempering material category is found in six samples of Reserve Plain Corrugated, Reserve Indented Corrugated, and Reserve/Tularosa Plain Corrugated. The six samples were collected from three sites (Table 108).

The tempering grains in this category are coarse-grained fragments of crushed andesite. The grains are angular, and the maximum size of the rock fragments ranges from 1.0 to 3.5 mm, probably reflecting the degree of crushing applied to the rock material during ceramic preparation.

Except for G17, which has a large amount of zoned feldspars, all the samples are similar in petrographic attributes. The clay in all the sherds has an abundant amount of silt-sized materials, the clay matrices display a mottled texture, and the estimated percentage of temper ranges from 20 percent to 35 percent. The small size of the quartz grains and the sparse amount of quartz indicates that it was present in the raw clay. The clay is from a secondary rather than a primary source.

Zoned feldspars are indicative of extrusive volcanic rocks, but such a large number of zoned feldspars in the tempering composition of G17 suggests that it does not share the same locus of manufacture as the other andesite-tempered ceramics.

Andesite flows are reported in the Gallo Mountains, and it is possible that the ceramics containing andesitic temper were made, if not in the sites under investigation, then in the immediate area to the south. The G17 sherd appears to have been made in the vicinity of a lava flow that was locally enriched in zoned feldspar crystals, quite possibly in the vicinity of the Gallo Mountains.

It appears that the Plain Brown Ware and the Reserve utilities, some of which are tempered with sand-plus-volcanic rock fragments, and some with andesitic rock fragments, come from two distinctly different loci of manufacture. Perhaps this reflects the seasonal movement of people into the project area who brought with them ceramics made elsewhere.

Augite-latite rock fragments. There are four sherds in this tempering material category. Though they were all collected from one site, LA 5407, an early habitation site, one sample is San Francisco Red, and three are Alma Plain sherds (Table 109).

The tempering material consists of angular, coarse-grained rock fragments of augite-latite composition. The only feldspar is twinned feldspar. Augite (a pyroxene) and brown biotite are present in amounts greater than expected for accessory minerals. The sherds appear to represent ceramics that share a common manufacturing area.

Rugge (1985:147) reported the presence of augite-latite in the brown wares of his Fence Lake ceramics. Neither Rugge's nor my search of the geologic literature produced a reported source for this rock. My search through descriptions of latite in the west-central New Mexico volcanics disclosed that the phenocrysts occurring in the latites are hornblende, biotite, plagioclase, sanidine, and quartz. Augite, a pyroxene, is not listed as a phenocryst. It is quite probable that an augite-latite flow is present somewhere in the extensive area covered by the volcanic activity during the Tertiary, but, to date, one has not been reported. The probability is that these augite-latite-tempered sherds represent ceramics imported into the Gallo Mountain project area.

Metamorphic rock fragments. Three of the sherds contain rock fragments that originated in a coarse-grained metamorphic rock, possibly a schist. Two of the sherds are Pueblo II corrugated (gray wares), and the third is Reserve Indented Corrugated. The samples are from two different sites (Table 110).

The two Pueblo II sherds are similar in composition of tempering material, silt-sized content of clay, and texture of the clay matrix. The rock fragments are angular and coarse-grained, and exhibit metamorphic characteristics. G24 has rock fragments with mica in parallel orientation, suggesting a mica schist.

Metamorphic rocks outcrop in the Zuni Mountains 23 km to the north of the project sites. To the south, the metamorphic rocks of the Burro Mountains are a little over 30 km from the sites. Metamorphic rocks are more plentiful east of the Rio Grande, where they outcrop almost continuously in a north-south-trending line for virtually the entire length of New Mexico.

It appears, then, that the two Pueblo II ceramics were made elsewhere and traded into the project area, possibly from the north. The third sample, G18, a Reserve utility ware, is distinctly different in petrographic attributes from the Pueblo II samples. It does contain metamorphic rock fragments, but it has an abundant amount of silt-sized material in the raw clay, a mottled rather than a homogeneous texture, and only a trace of feldspars, whereas G23 and G24 contain 10 to 15 percent feldspars in their tempering composition. This Reserve utility vessel appears to have been imported but from a different locus from where the Pueblo II corrugated ceramics were produced.

Sherd temper. This category of tempering material was in three samples. All are Pueblo II corrugated, and all are from the same site. Table 111 contains the petrographic data observed for these sherds.

Except for the size of the sherd fragments in G13, these three sherds are similar in all attributes and undoubtedly were produced in the same locus. The sherd fragments are petrographically similar to the ceramic items in which they serve as tempering material.

It is difficult to assign an area of manufacture to sherd-tempered ceramics unless there is some other geologic indicator. Perhaps these ceramics originated in the north, like the Pueblo II utility wares containing the metamorphic rock fragments.

Groupings by Ceramic Types

When the 30 sherds are grouped by ceramic type, it is evident that most of the types contain more than one kind of temper (Table 112).

The ceramics containing augite-latite, the metamorphic rock fragments, and the sherd fragments were produced elsewhere. These ceramic types include some of the San Francisco Red and Alma Plain and Pueblo II corrugated sherds, and one of the Reserve Indented Corrugated sherds. Probably these ceramics were imported into the project area.

Ceramics containing the sand-plus-volcanic rock fragments and the andesite rock-tempering materials appear to have been either locally made or made in sites adjacent to the Gallo Mountains. These ceramics comprise the majority of the sherds and include some of the San Francisco Red, some of the Alma Plain, and all but one of the Reserve utilities and brown wares.

In general, it appears that the Alma Plain tempered with augite-latite and imported into the early habitation site, LA 5407, is different from the locally produced Alma Plain found at the early special-use site, LA 14906.

The five San Francisco Red sherds were also recovered from the two early sites. Four of the ceramic items were locally produced, and the fifth, containing augite-latite, appears to be an imported item.

The Reserve utility wares, the Plain Brown wares, and the Pueblo II utility wares were recovered from the later sites: LA 6076, LA 14858, and LA 14909. The Reserve utility wares, except for G18 and the Plain Brown wares, are interpreted to be locally produced or made in drainages adjacent to the project area. The Pueblo II utility wares, some of which are sherd tempered and some of which contain metamorphic rock fragments, are interpreted to have been imported into the project area sites, probably from the north.

Conclusions

The petrographic analysis of 30 sherds from Gallo Mountain sites was undertaken to determine what temper categories are present in the seven ceramic types collected from five sites, which ranged from early to late and included habitation and special-use sites. The examination reveals that the ceramics contain five temper categories: sand-plus-volcanic rock fragments, andesite rock fragments, augite-latite rock fragments, metamorphic rock fragments, and crushed-sherd fragments. In addition, the sand-plus-volcanic rock fragments could be subdivided into one group in which the quartz grains are of metamorphic origin and a second group in which the quartz grains are of sedimentary origin.

As can be seen in Table 112, most of the ceramics contain more than one temper type. The ceramics that contain the metamorphic rock fragments and the crushed-sherd temper are interpreted as having been produced elsewhere, probably to the north, and entering the project area via an appropriate trading network. The ceramics with the augite-latite temper may have been made in an area close to the project sites, where the igneous flow contained abundant augite crystals. These "imported" wares include one San Francisco Red sherd (G1), three Alma Plain sherds (G2, G3, G4), all of the Pueblo II corrugated, and one of the Reserve Indented Corrugated sherds (G18).

The remaining ceramic wares, the Plain Brown wares, and the Reserve Corrugated wares were found in all of the later sites, and, discounting G18, which contains metamorphic rock fragments, have either andesite rock fragments or sand-plus-volcanic rock fragments as tempering agents. These ceramic sites were locally produced or manufactured in drainages adjacent to the Gallo Mountains.

All the petrographic data recorded for each of the thin sections has been compiled in Table 105. This includes the composition and maximum size of the tempering grains and the characteristics of the clay matrix that can be observed with a petrographic microscope. The data revealed a diversity of temper categories, even within ceramic types. Many of the Plain Brown wares are interpreted to be trade items. The utility ceramics for the most part appear to be locally made or made in sites adjacent to the project area.

Discussion

Much of the literature concerning the Quemado area notes an increase in the proportion of brown utility wares as compared to gray utility wares over time. In his survey of the Largo and Agua Fria Creek valleys, Danson (1957:53-54) found primarily brown utility with a few intrusive gray wares in his pre-Pueblo I and Pueblo I–Pueblo II periods. Gray wares were present at 9 of the 11 Pueblo II sites. Two Pueblo II–Pueblo III sites from the northern portion of the Largo valley had more gray than brown utility; however, these sites were built on sandstone outcrops and must be north of the Gallo project area.

Just to the north, in the Mariana Mesa area, Danson (1957:68-74) described a different distribution of brown ware and gray ware. The pre-Pueblo I site of Cerro Colorado had many brown wares, but they were not as numerous as the gray ware. Gray utility wares continue to outnumber brown wares in Danson's Pueblo I–Pueblo II sites and in most, but not all, Pueblo II sites. Brown wares far outnumber gray wares in the Pueblo III sites.

Recent surveys in the Fence Lake and Coal Lease areas just west of Danson's Mariana Mesa area report fewer brown wares (Camilli et. al 1988:5-52; Fowler 1985:128). Both surveys found that the percent of brown wares increased from Pueblo I through Pueblo III. Neither found that, on average, brown wares were far outnumbered by grays in Pueblo III sites (Table 113).

Mills (1987a:108-109), working with excavated materials from Fence Lake, compared her assemblages with tree-ring-dated assemblages from New Mexico and Arizona. She found a general trend of increasing proportions of brown ware, except the period from A.D. 1050 to 1150 exhibits a high degree of dispersion.

The data from the Gallo sites is the inverse of that from Fence Lake. Brown wares almost always far outnumber gray wares, with the exception of the two structures that comprise the earlier samples from LA 6076. The Gallo brown ware percentages, however, are not as high as those from Gallita Springs, to the south and east (Table 114).

Studies of clay and tempering materials suggest the differences in the gray and brown wares found at the Fence Lake and Gallo sites are not the result of firing technology. Rugge's (1985:140) petrographic analysis of 30 brown ware sherds from Fence Lake revealed two principal temper groups. Category A (n=12), augite-latite, was found in later dating wares: plain, smudged, corrugated, and indented corrugated. In the Gallo sample, all of the augite-latite temper was found in the early wares, the Alma Plain and San Francisco Red sherds from LA 5407. There are also differences in the tempering material itself. The Gallo sherds have slightly more augite-latite, averaging 89.5 percent of the temper, compared to 73.0 percent in the Fence Lake sherds. Quartz averages 3.2 percent in the Gallo sherds and 6.7 percent in those from Fence Lake. Brown biotite is present in 3 of the 4 Gallo samples but only 2 of 12 Fence Lake samples.

The same is true of Rugge's temper category B, fluvial sands with volcanics (n=14). While almost half (14 of 30) of the Gallo samples were tempered with sand-plus-volcanic rock fragments, the temper differed from Rugge's description. Category B consists of subrounded to rounded temper fragments (Rugge 1985:145), while that in the Gallo sherds is angular to subrounded. The sand content ranges from 60 to 90 percent (averaging 78.5 percent) in the Gallo sherds and 48 percent to 75 percent (averaging 56.7 percent) in the Fence Lake samples, and the sand particles are smaller in maximum size in the Gallo samples (averaging 0.5 mm, compared to an average of 1.0 mm). Samples from both contain twinned feldspars (plagioclase), basalt, glassy basalt, and chert.

Garrett (1987:163) analyzed an additional nine brown ware sherds from the Fence Lake excavations and found that all nine fell into Rugge's category A. She also analyzed 15 gray ware sherds and concluded that these came from three distinct production loci: one with igneous rock temper, one with crushed sherds, and a third with neither igneous rock nor sherd fragments.

The five gray ware sherds analyzed from Gallo had sherd (n=3) or metamorphic rock temper, possibly schist (n=2). None of the gray wares from the Fence Lake sites had metamorphic rock fragments in the temper (Garrett 1987: Appendix 5). A small number of the Cibola white wares examined by Rugge (1985:148-155) did have sherd temper with granite. Three of the Gallo gray ware samples have sherd temper. Two of those from Fence Lake had quartz/sherd temper, and two others had some sherd fragments. Small amounts of quartz were found in all three of the Gallo sherds, but the quartz was smaller in maximum size (0.8, 0.3, and 1.1 mm at Fence Lake, compared to 0.1 mm for all three of the Gallo sherds). Sherds from both areas are made from clays that are homogeneous in texture. Temper comprises 15 percent of the sherd in the Gallo samples and 20 percent in the Fence Lake samples. Garrett (1987:169) felt that some of the Fence Lake gray wares could have been locally made. The Gallo gray wares were all imported.

Mills (1987b:146-154) refired 157 sherds and clay samples from Fence Lake to determine which wares may have been made from local clays. She found that gray wares predominantly fired buff in color, brown wares fired red, and the local clays fired a yellowish red. Two brown and one gray sherd fired yellowish red, but in general, the tests confirm that different clays, not just firing technique, accounts for much of the difference in color.

Probably the most significant contrast between the Fence Lake and Gallo area is the greater variability of temper types in the brown ware sherds from the Gallo sites. Six distinct temper types were found in 25 sherds, and most of these cut across ceramic types. The diversity suggests a number of production loci and an active exchange of wares. This contrasts with Fence Lake, where the temper in 39 brown ware sherds was primarily of two types, leading Mills (1987b:150) to suggest that the homogeneity may reflect specialization in production.

The results of the petrographic analyses suggest little direct interaction between the Fence Lake and Gallo populations. They may also suggest that exchange between the two areas was not of the same nature as between the Gallo residents and other "Mogollon" groups.

Table 115 compares the type of ware and vessel form. Painted white wares appear to be more common in the Fence Lake sites, while the White Mountain Red wares are better represented in the Gallo sites. The amount of white ware in the Gallo sites is relatively consistent, ranging from 7.0 to 14.0 percent of the assemblage. The table also shows the inverse relationship between gray and brown wares in the two areas and suggests that more brown wares were used at the Fence Lake sites than gray wares in the Gallo sites.

We might expect some differences in assemblage composition based on site function alone. While many of the Gallo sites are residential, the Fence Lake sites include a day-use site (LA 48644), an ephemeral fieldhouse (LA 48649), and a seasonal jacal structure (LA 48642) (Hogan 1987). Since there was considerable inconsistency in how forms were assigned to the brown wares in the Gallo samples, differences in vessel form cannot be addressed.

LITHIC ANALYSIS

Karen Wening

Three phases of lithic analysis were undertaken for the Gallo project sites. Phase 1, in 1977 and 1978, involved the analysis of LA 6074, LA 6075, LA 6076, LA 6077, LA 14463, and LA 14858. The original analyses of the material from these sites is not presented here, since these artifacts were reanalyzed as Phase 3. Phase 2, in 1982 and 1983, dealt with LA 14882, LA 14906, LA 14907, LA 14908, LA 14909, LA 14910, LA 14917, LA 14920, and LA 14930. Phase 3, in 1988, is a reanalysis of Phase 1 sites and the analysis of LA 5407. Unfortunately, the lithic artifacts from LA 6077 (n=11) and LA 14463 (n=1) could not be located for reanalysis, so the original reports for those sites are used here.

Phase 3 also involved reanalysis of Phase 2 site tools. This tool reanalysis was undertaken to provide uniform data on tools from all sites so the results could be compared with Nelson's (1981) Mimbres Valley data.

For most sites, data from the most recent (1988) analysis is presented rather than that from the original, 1983, analysis. For Phase 2 sites, the original 1983 reports are presented with some modifications. Specifically, lithic material groupings were reanalyzed to conform to the current project and the lithic tool discussions. Also, some core reanalysis was undertaken, particularly for those cores which were originally classified as "random." Thus, differences in the report from site to site are apparent, particularly with regard to the debitage, which was originally analyzed according to reduction stages (primary, secondary, etc). In contrast, the current analysis is concerned with reduction methods and subsistence strategies, as can be shown through tool-material and edge-angle groupings.

Thus, the project sites are divided into two groups: those analyzed with Phase 2 methods and those analyzed with Phase 3 methods. These analysis methods are described with the results from each group of sites. The core analysis is presented for the entire project and for individual sites.

Typologies and Methods (Phases 2 and 3)

A total of 19 material types and 32 colors were encountered during analysis. Following their individual description, materials are grouped into seven categories according to similar fracture characteristics: rhyolite, chert/chalcedony, silicified wood, igneous (primarily basalt), obsidian, siltstone and claystone, and quartzite. For the final discussion, two major categories are referred to: *durable* materials, which consist of rhyolite, igneous, siltstone and quartzite materials; and *brittle* materials, which consist of chert, chalcedony, silicified wood, and obsidian.

Rhyolite is the largest material group at nearly every site. Three subgroups were recognized, the most abundant of which is red rhyolite, a durable, sugary material virtually free of impurities. This red rhyolite originates at LA 15101, a quarry site about 9 km south of the project area in Largo Creek Canyon. Survey data concerning the quarry at LA 15101 list the material as siltstone, as does Warren (1972:27) for identical material in the nearby Whiskey Creek area. In previous lithic analyses for the Gallo sites, the term *rhyolite* was used for the material and will continue to be used here. The material texture resembles that of fine-grained quartzite but is less dense. The second largest subgroup is gray rhyolite, having clear and dark crystalline inclusions in a gray chertlike matrix and referred to as volcanic in origin from the Datil formation in the Whiskey Creek area (Warren 1972:27). This material is extremely durable and reliable for knapping despite the crystalline inclusions. A variation on this gray rhyolite is identical in appearance except for the poorly indurated, almost powdery gray matrix. The same biotite phenocrysts are present. Its poor knapping quality explains its extremely low frequency or complete absence at all sites. The third rhyolite subgroup is a dense, somewhat cherty material which has gray to black banding and/or specks in a red matrix. It frequently grades to the sugary texture of the red rhyolite, and in some pieces, the two subgroups coexist in one artifact, indicating an identical origin at the LA 15101 quarry site.

Chalcedony is comprised of three subgroups, the most distinct of which is Apache Creek chalcedony or agate, a clear and white-banded, fault-ridden material. It occurs in seams or nodules in andesite flows of the Datil formation in the mesas above Apache Creek (Warren 1972:25). Nodules contain a clear or milky center surrounded by irregular clear and white concentric rings. Clear crystalline impurities frequently occur. Black or brown inclusions are sparse and infrequent. The clear centers of the chalcedony exhibit good conchoidal fracture qualities, while the outer, banded area and cortex break along structural planes. The second, or generalized, chalcedony subgroup is by far the largest, with the vast majority occurring as clear and/or white with sparse brown, black, or gray inclusions. This material also occurs as red, green, and black (Warren 1972:26), although very few artifacts of those colors were found. Exceptional colors include combinations of pink, tan, and green; combinations of black, white, and pink; dark orange; gray and green; tan or cream; and a pink and white Pedernal-like chalcedony. Where the distinct banding of Apache Creek chalcedony was absent, the artifact was recorded simply as chalcedony, though the vast majority originate in the Apache Creek area. Eleven pieces of fossiliferous chalcedony are clear, white, brown, or gray with small rodlike fossil inclusions.

Chert includes fossiliferous, clastic, jasper, and Apache Creek chert. Colors are primarily black, white, gray, red, and green. Chert from unknown sources are cream, pink, orange, yellow-brown, brown, a pink and white Pedernal-like chert, and one or two examples each of the following, unusual color combinations: pink, tan, and green; pink-banded, gray, and green; and green, white, and pink. Since green, white, and red cherts occur around Apache Creek, these color combinations are probably locally available.

Igneous materials are almost exclusively a dense, gray to black, uniformly textured, crystalline rock. Brown, gray, green, and black-banded igneous materials are represented by one or two examples each. All igneous materials probably originate in the andesite flows of the Datil formation, which outcrops at numerous locations in the project area. Igneous materials are rarely selected for chipped stone use, and a substantial portion of flakes of this stone may be the result of efforts to shape ground stone tools.

Obsidian is represented by various degrees of translucence and inclusions, the vast majority of which appear to be local. The most numerous type is a clear gray, which may be a variation of Red Hill obsidian north of Apache Creek (Warren 1972:28-29). The second largest obsidian subgroup is a "waxy, silvery obsidian," also of the Red Hill area (Warren 1972:28). A single piece of black obsidian may have originated near Mule Creek, south of Glenwood, near Luna, or in a number of locations in the mountains south and west of Apache Creek (Warren 1972:28). A single flake of clear and brown-banded obsidian is unsourced.

Siltstone/mudstone is brown or green, with infrequent examples of yellow-brown and red. The siltstone, comprising the overwhelming majority of this material groups, exhibits a granular, dense, uniform texture with good fracture. The mudstone has a silty texture with poor fracture qualities.

Quartzite is fine grained and occurs in a variety of colors: gray, white, black, brown, green, yellow-brown, and one unusual flake of gray and red-banded quartzite. Warren (1972:28) cites the Gila and volcanic conglomerates near Quemado as the source area for quartzite from the Whiskey Creek sites, but it seems likely that a source closer to the Largo Canyon area exists.

Silicified wood is not insignificant in the lithic assemblage, but its source is unknown. The vast majority of silicified wood is clear, white, brown, or combinations of clear and black or clear and brown. Single examples of black, gray, red, and yellow-brown or red palm wood complete the color range. All silicified wood exhibits excellent conchoidal fracture virtually free of impurities. The source for silicified wood is suspected to be local, because mean debitage size is greater than for local chert and chalcedony, and cortex amounts are greater than for local materials.

Phase 2 Methods

This analysis was "undertaken with the idea to simply record the information in an efficient manner allowing for interpretation of the assemblages in light of the extent of on-site lithic industry, manufacture stages, and functional and stage classes of tools" (Post n.d.). Debitage was divided into five classes: primary flake, secondary flake, tertiary flake, angular debris, and core fragment. These classes were used to monitor the stage of manufacture and to investigate core reduction at the sites. Material type, weight, and provenience were recorded. Flake size was built into the different flake types. Material types were analyzed to correspond with Phase 1 material types.

In the Phase 2 analysis, primary flakes are defined as flakes where the dorsal face retains greater than 90 percent cortex. Secondary flakes have some cortex, but less than 90 percent cortex on the dorsal face (Crabtree 1972). Secondary flakes are generally greater than 1 cm long and wide, 0.5 cm thick, and weigh over 1 g. Tertiary flakes have no cortex (Crabtree 1972), and dimensions are generally less than 1 cm long and wide, 0.5 cm thick, and weigh less than 1 g. Angular debris have no flake characteristics and are sometimes referred to as shatter. Core fragments are usually large pieces of material exhibiting negative dorsal flake scars, flake morphology, and at least one striking platform.

Cores were analyzed for material type and color, cortex amount, degree of heat treatment, dimensions in millimeters, and weight in grams, using the same variable previously described for the debitage analysis. Additional attributes include platform type (cortical, flake scar, or combination of both), presence or absence of wear (including hammerstone use), core type, and core condition (exhausted/not exhausted).

The following core types were used: (1) Single-platform cores exhibit flakes removed from a single cortical or prepared platform. Platforms are usually prepared by the single longitudinal removal of a large flake. (2) Two-parallel-platform cores possess two opposing platforms, prepared and/or cortical, from which flakes have been removed. (3) Two-adjacent-platform cores have adjoining platforms, prepared or cortical, at any orientation. (4) Three-adjacent-platform cores exhibit three adjoining platforms, only two of which may be adjoining, as in a linear arrangement.

In other words, each platform need not be adjoining the other two. (5) Two-adjacent, one-single-platform cores exhibit two adjoining platforms and one single, separate platform. (6) Two-parallel, one-adjacent-platform cores possess two parallel platforms with one additional platform adjoining one of the parallel platforms. (7) Test cores exhibit one or two flake removals from one platform.

Tools were first analyzed as debitage, using the previously listed debitage attributes. They were then analyzed for tool type, presence and direction of use wear (e.g., unidirectional or bidirectional scarring), edge contour (plan view), edge-production angle or spine/plane angle (original angle measurement prior to use as opposed to the angle altered from use), presence or absence of cortex reinforcement, and presence and direction of retouch modification (Nelson 1981). Cortex reinforcement refers to the presence of cortex on a tool, either on or away from the utilized edge.

The 23 tool types are based primarily on wear analysis and secondarily on edge angle. Lithic tools are often classified according to edge angle regardless of the wear pattern. For example, edge angles of 40 degrees and greater are assumed to be used for scraping, even if wear is bidirectional along that edge. Acutely angled tools of 40 degrees and less are assumed to be cutting tools, even if unidirectional wear is present along that edge. The Gallo project contained an unusual group of tools with very acute edges and unidirectional wear as well as steep-angled scrapers exhibiting bidirectional wear, a scraper type that was found in abundance at an early pithouse village site near Alamogordo (Oakes in prep.). Tool function is more accurately assigned using both edge angle and directionality of wear, and though greater tool variety usually results from this grouping method, it better illustrates the range of activities occurring at any given site (e.g., Siegel 1985:93).

In the Phase 3 debitage analysis, all lithic artifacts were monitored for material type and color, debitage type (flake, angular debris, or pebble), cortex amount (none, 1-25, 26-50, 51-75, 76-99, or 100 percent), which for flakes was analyzed as the amount cortex on the available surfaces (platform and dorsal), dimensions in millimeters, weight in grams, and degree of heat treatment (none, heat treated, overexposed, burned). Flakes were also monitored for one of 14 platform types: (1) Single-flake-scar platforms consist of a single flake scar covering the entire platform. (2) Flat multiple-flake-scar platforms have at least two nonpatterned flake scars, which create a flat surface across the width, or platform length. (3) Rounded multiple-flake-scar platforms have at least two nonpatterned flake scar removals forming a rounded platform. (4) Peaked multiple-flake-scar platforms consist of at least two nonpatterned flake scars forming a pointed, acutely angled platform. The platform is usually very deep, often nearly equal to the flake's length, giving the lateral cross section an equilateral triangle shape. This platform type may increase platform stability by providing a restricted surface area upon which to strike. (5) *Pseudo-dihedral*, a term modified from the Old World analysis term *dihedral* (Wiseman, personal communication). The morphology is identical to that of the Old World platforms, a "pitched roof" shape, but is not formed by the distal juncture of two flake removals. In the New World, the platform type appears to be primarily fortuitous (Wening 1994). Pseudo-dihedral platforms allow for a restricted, stable point from which to detach a flake and are found primarily on dense material such as rhyolite, igneous rocks, siltstone, and quartzite. (6) Ridge platforms display virtually none of the original striking area, with the platform consisting of an edge only. Resultant flakes are usually short and thin and often exhibit a marked inward, ventral curve. (7) Pointed platforms also retain virtually none of the original striking area. The platform consists of a thin point with lateral flake edges dropping off sharply to form a thin, elongated flake. (8) Bidirectionally retouched platforms are the by-product of biface thinning or reduction. They typically exhibit platform angles of 45 degrees or less and several overlapping dorsal flake scars, often removed parallel to the flake length. They are small, thin, and almost exclusively of crypto-crystalline siliceous materials such as chert, chalcedony, and obsidian.

(9) Unidirectionally retouched platforms exhibit all the characteristics of bidirectionally retouched platforms except for the single direction of the retouch. They are by-products of uniface manufacture. (10) Shattered platforms consist of a sharply jagged edge at the proximal end, where the platform once was. Flakes with shattered platforms are usually thin and small. Shattered platforms result from too great an impact to the platform area and occur primarily on brittle materials such as chert, chalcedony, and obsidian. Flakes with shattered platforms are considered complete unless a distal or lateral portion is missing. (11) Battered platforms are the result of repeated unsuccessful attempts at flake detachment. Though hammerstone flakes also exhibit battered platforms, they are separated from this group of flakes. (12) Abraded platforms exhibit pronounced rounding and striations, the result of the hammerstone being rubbed across the platform. Such abrasion strengthens and stabilizes the striking area, particularly on brittle materials, among which 100 percent of all abraded platforms are found in the assemblage. (13) Cortical platforms are 100 percent cortex. (14) Cortical/single-flake-scar platforms are simply a combination of cortex and a flake scar.

Five flake types were recognized: (1) Core flakes are flakes which have been detached from a core. They comprise the vast majority of flakes on the project. (2) Sidestruck platform rejuvenation flakes retain a portion of an unsuccessful platform on the dorsal surface. These flakes are thick and triangular in cross section, with a pronounced ridge running the length of the flake. One side of this ridge is the old platform, the other exhibits a series of frequently hinged flake scars, indicating the core was turned on its side to remove the flake. Two variations of this flake type are topstruck rejuvenation flakes, which are detached above the old platform at approximately the same angle of percussion, and distal platform rejuvenation flakes, in which the core is rotated 180 degrees and struck opposite the old platform. Platform rejuvenation flakes (n=22) comprise a mere 2 percent of all those from LA 5074 through LA 14858. (3) Biface reduction flakes are thin, small flakes with bidirectionally retouched platforms measuring 45 degrees or less. A series of overlapping dorsal flake scars are present. They are almost exclusively of crypto-crystalline siliceous materials, particularly obsidian, with a few rhyolite specimens. (4) Early biface reduction flakes were recorded during the analysis to gain a more complete representation of biface reduction from project sites. These flakes are identical to biface reduction flakes except that the platform is unrestricted as to type as long as the platform angle is 45 degrees or less. Early biface reduction flakes exhibit a variety of platform types, but the majority are single-flake-scar and multiple-flake-scar platforms. They are less numerous than biface reduction flakes (n=25), but the two types together comprise 5 percent (n=66) of the flake assemblage from LA 5407 through LA 14858. (5) Bipolar flakes exhibit two bulbs of percussion, one at the proximal and one at the distal end of the flake. The distal bulb is the result of the flake being placed on an anvil and struck with a hammerstone at the proximal end. A single chert bipolar flake was recognized in the assemblage.

Finally, flakes were monitored for condition as whole, proximal fragment, distal fragment, medial fragment, lateral fragment (platform may or may not be present), and corner fragment (length and width both incomplete).

Phase 2 Analysis

Cores and Debitage

The debitage analysis was set up to examine variation in the treatment of different raw materials and the amount of biface manufacturing occurring as shown through biface reduction flake frequencies.

It is important to note here that the lithic assemblage from the structure, Feature 39, and its antechamber, Feature 25, at LA 5407 is strongly influenced by the burning of the structure (619, or 17 percent, of the project lithic artifacts and 74 percent of the LA 5407 lithic artifacts are burned). Cores on the structure floor during the fire were heated to the point of complete fracture or were made unstable enough that subsequent freezing, thawing, and/or water saturation fractured them into dozens of pieces of "debitage." Some effort was made to reassemble these fire-fractured cores since several were broken in situ, but it was quickly realized that the time involved in the task was too great. Rhyolite cores fractured in the fire are completely blackened over all surfaces of the resulting debris, whereas rhyolite cores heated and subsequently fractured by the elements are blackened on their "dorsal" surfaces only. Igneous materials responded in the same manner. The vast majority of the debitage exposed to heat is either burned or blackened, as with rhyolite, siltstone, and igneous materials (underexposed); riddled with fire-popped craters, as with chert, chalcedony, and silicified wood (overexposed); or fused, as in the case of one obsidian flake (overexposed). The percentage of heat-treated materials is low for LA 5407 exclusive of the above extremes. The importance of the fire's destruction, aside from the increased "debitage" frequency, is the decrease in cores, though probably a relatively insignificant one. More important is the tendency for the fractured cores to produce spalled "flakes" with ridge platforms, greatly increasing the frequency for that platform type. Since the degree of heat exposure was recorded for all lithic materials, a more objective perspective can perhaps be reached for those artifacts not exposed to the fire. The debitage and core assemblages of different materials vary but appear to be influenced primarily by the amount of reduction occurring at the source location rather than by material characteristics.

Quarry or outcrop sources for nearly all project materials are within 8 km of the sites, except perhaps silicified wood, virtually eliminating varying source distance as a major influencing factor in the treatment of materials. Rather, the amount of reduction occurring at the source versus the site has the greatest effect over the site debitage. This can best be shown by contrasting the core type, platform type, and cortex percentage frequencies of the two largest lithic types, rhyolite and chert/chalcedony (Table 116). Rhyolite cores were clearly being partially reduced, perhaps only to the point of decortication, at the aforementioned quarry site, LA 15101. This is evidenced by comparatively high percentages of multiple-platform rhyolite cores co-occurring with large core size. Cortex percentages for rhyolite cores and debitage are comparable to those of chert/chalcedony despite the larger size of the rhyolite cores. Chert/chalcedony cores, by contrast, show much higher percentages of single and double platforms despite their smaller mean size. While the size variation of the artifacts of the two material groups is no doubt caused by varying raw material size at the source, the relative core type percentages appear to indicate like reduction of materials.

Decortication of rhyolite cores occurred primarily at the quarry, probably through use of a single platform created by the lengthwise removal of one large flake. At this point, cores may have been transported to the site, where additional flakes were removed, creating up to three platforms. Chert/chalcedony cores, on the other hand, appear to have been either brought to the site as nodules or were reduced off-site only enough to create a single platform (removing one or two flakes). The relative lack of multiple platforms on chert/chalcedony cores is perhaps attributable to the small size of the parent material and/or to the original nodule form of the material, restricting possible reduction methods. The major flaw in this off-site rhyolite reduction theory is the much higher percentage of cortical platforms in the rhyolite flake assemblage, compared to chert/chalcedony (8 and 1 percent, respectively). Yet among debitage assemblages of both materials, cortex amounts are comparable, with high percentages of "zero" cortex and gradually decreasing amounts of higher cortical amounts, as shown in Table 117.

The high percentage of cortical platforms for debitage flakes may speak more for the manner of decortication and subsequent reduction than the location of decortication. Decortication apparently involved the removal of flakes whose ventral surfaces would then become the dorsal surface of subsequent flake removals. In other words, cores were rarely being prepared by the removal of large flakes, which would then serve as platforms. In any case, the evidence of off-site rhyolite reduction is far stronger than that supporting the transportation of the raw, unmodified material from the quarry source directly to the sites.

Other materials such as basalt and quartzite display greater amounts of cortex, probably due in part to on-site reduction, both as chipped stone tools, hammerstone use, and ground stone tool shaping. These materials are also abundantly available throughout the entire project area and not restricted to quarry/outcrop sources, like rhyolite and chert/chalcedony.

Rhyolite was valued for tools, particularly in unmodified flake form. The larger size of rhyolite cores would enable the knapper to produce more serviceable flakes from those cores and may in turn result in the creation of multiple platforms. Since it cannot be assumed that multiple platforms alone denote more complex reduction strategies, because equal numbers of flakes could be removed from two or even one platform, the larger size of rhyolite plus the preference of the material for tools are believed to be related to the high percentage of multiple-platform cores in the rhyolite assemblage.

Tools

One of the primary goals of the Gallo project tool analysis was to compare the resulting data with Nelson's (1981) study of lithic artifacts from 12 sites in the Mimbres Valley. Nelson found correlations between high frequencies of steep-angled tools of durable lithic materials and increased dependence on plant foods through time, as well as a decrease over time in animal-processing tools, those of brittle materials with extremely acute edges. Using debitage and unmodified tools, Nelson monitored a number of attributes, all of which have been included in the Gallo project analysis. It is important to note several differences between the Mimbres Valley sites of Nelson's study and the Gallo sites. First, the Mimbres Valley sites are in the Mogollon culture area, whereas the Gallo Mountain sites are in the Mogollon-Anasazi contact area. Second, Nelson's 12 sites occupy a long, continuous time span from the Early Pithouse period (A.D. 550-600) to the Classic Mimbres (A.D. 1000-1150). By contrast, the Gallo sites, though they span a comparable period of time (A.D. 500-1200), the representation is not continuous. Most of the sites cluster in the Early Pueblo period (A.D. 1000-1150), and ceramic dates continue until A.D. 1250. The exceptions, two Early Pithouse period sites (A.D. 500-600), LA 5407 (848 lithic artifacts) and LA 6074 (2 lithic artifacts), and one site with a possible Archaic component (LA 14906, represented by one paleo/archaic projectile point), provide a discontinuous occupation upon which to base trends in lithic tool use over time. Also, a number of sites either did not yield any tools or too few to be used in a percentage comparison study, and thus remain unrepresented in this sample (LA 6074, LA 14882, and LA 14917 have no tools; LA 14907 and LA 14910 have one tool each). Third, Nelson does not employ tool use-wear analysis in her study, no doubt due to the subjectivity of those attributes, but a trait that was monitored for the Gallo tools. Because of the above differences, the tools are first described in functional groups based on tool morphology and observed wear patterns.

Then, to compare Gallo data with Nelson's Mimbres data, unmodified tools are grouped into one of four material/angle categories: (1) Durable/acute are tools of rhyolite, basalt, siltstone, or quartzite with edge angles between 15 and 40 degrees. (2) Durable/obtuse are tools of the above listed materials with edges measuring between 45 and 85 degrees and considered most appropriate for plant processing. (3) Brittle/acute are tools of chert, chalcedony, silicified wood, or obsidian with edge angles between 15 and 40 degrees and considered the most appropriate for animal processing. (4) Brittle/obtuse are tools of the above listed materials with edge angles between 45 and 85 degrees.

The percentage groupings of these tools is a vastly simplified version of Nelson's analysis, which involved correlations between a number of attributes: edge contour, edge angle, and cortex reinforcement (Nelson 1981:133), to name a few. Although the attributes monitored are not out of the range of this project, the mathematic functions performed on the data are. Nelson also used chi-square analysis to determine significant relationships between the attributes, a procedure which was not used for this analysis.

A wide variety of informal tools were identified. The term *shaver* (n=40) is used for a group of unmodified flakes that exhibit unidirectional scarring on acute edges with a maximum measurement of 35 degrees. Flakes are typically small and elongated. Wear is virtually always light, with surprisingly little damage to these thin edges (angle range 15 to 35 degrees), and it is clearly unidirectional. It was expected that these tools would be almost exclusively of durable materials such as rhyolite and basalt, but brittle materials such as chert/chalcedony (n=14), obsidian (n=3), and silicified wood (n=4) outnumber the rhyolite (n=18) and igneous (n=1), representing 52 percent of the shavers. It was expected that shavers of brittle materials would cluster at the less acute end of the angle range, from 30-35 degrees, but the opposite occurred, with the majority of brittle materials falling in the 15-25 degree range. Rhyolite, by contrast, clustered in the 30-35 degree range, again the opposite of what was expected, since the greater durability of rhyolite would presumably make it a more serviceable tool in the extremely acute angle range (Table 118).

While this angle distribution is obviously related to the tendency of crypto-crystalline materials to fracture along extremely acute edges and crystalline materials to fracture along blockier, less acute edges, these flakes were nevertheless chosen for use as tools, even though edges measuring under 30 degrees have been determined to be of little use for animal disjointing (Ahler 1971:84). Edges measuring as little as 19 degrees are documented among the Australian Aborigines, however (Gould et al. 1971:151). The obvious desired quality was an extremely sharp edge for light, one-time use or only durable enough for light use. Since wear is exclusively unidirectional, manipulation may have been a light, shaving motion. However, experiments with rhyolite knives used in a reciprocal, sawing motion created unidirectional wear rather than the bidirectional wear usually associated with cutting (Foster et al. 1982:294).

Knives (n=76) are thin, elongated, unmodified flakes exhibiting either bidirectional scarring or a wear pattern termed "snapping." Snapping involves a thin edge breaking off from pressure and leaving a thin, nearly 90 degree angle along that edge. Knife wear patterns indicate a cutting or sawing bidirectional motion. Edge angles range from 15 to 40 degrees, with peak frequencies at 20 and 35 degrees (28 percent; n=22 each). Durable and brittle materials are nearly equally represented (37 and 35 edges, respectively), though edge-angle distributions differ. The vast majority of durable materials peak at 20 and 35 degrees, and brittle materials show a much more even distribution throughout the entire range (Table 119).

Scrapers (n=181) are overwhelmingly of rhyolite (n=119), with small amounts of other durable materials--igneous (n=10), siltstone (n=1), and quartzite (n=2)--comprising a durable material total of 132 (73 percent). Brittle materials such as chert/chalcedony (n=39), obsidian (n=7), and silicified wood (n=3) comprise the remaining 27 percent. Scraper edge angles range from 30 to 85 degrees. Nearly half of the tool group peaks at 40 and 65 degrees (23 and 24 percent, respectively). Wear patterns indicate three different manipulations were used. A single-position, planing type of motion resulting in dorsal unidirectional scarring and/or ventral surface abrasion is by far the most common manipulation method (92 percent; n=190 edges). Reversible use, which is simply a planing motion used on two opposing faces of the tool, results in scarring overlaid by abrasion. The scarring created on the dorsal surface is from use on the ventral surface, which, when flipped over, results in the scars being ground over. Reversible use is infrequent, present on 12 edges only (6 percent). The third and least frequently used method involves a "vertical" motion in which a long flake is used along a portion of the dorsal surface only. The flake is grasped at the proximal end and used on the dorsal surface of a typically expanding and thicker distal flake end. Reversible use is never observed on these tools, because the ventral surface is usually too concave to make contact. Both the reversible and vertical scraper motions were observed in artifacts from the previously mentioned pithouse village near Alamogordo (Oakes in prep.). Such motions are present at the Gallo sites in much smaller percentages.

Retouch modification is present on nearly one-third of all scraper edges (n=64; 31 percent). The vast majority received unidirectional marginal retouch, and a much smaller number exhibit facial retouch. This high percentage of scraper retouch modification was unexpected, since rhyolite is the predominant material and exhibits durable, obtuse angled edges in unmodified form. Retouch modification was apparently performed in this tool group to increase the edge angle even further, because virtually all retouched scraper edges fall within the 55-70 degree range. Scrapers are also notable for their large mean size, compared to other tool types (mean dimensions 4.3 by 3.7 by 1.3 cm; n=134 values).

Combination tools (shaving/scraping/cutting tools) (n=22) include knife/scrapers (n=10), knife/shavers (n=5), and shaver/scrapers (n=7). These tools exhibit two utilized edges, each with wear and angle measurements typical of that tool type. For example, knife/scrapers exhibit one bidirectionally worn, 40 degree or less edge and one unidirectionally worn edge ranging from 35 to 65 degrees (one vertically manipulated scraper edge is present in the knife/shaver group). Materials are distributed as shown in Table 120. Scraper/shavers display an unexpected material distribution in the high percentage of chert/chalcedony. Durable materials were expected to dominate this tool group.

Drills (n=6) and *scraper/drills* (n=2) are equally distributed between durable and brittle materials. They are typically unmodified flakes which have been used along a fortuitously formed, distal projection. Flakes used for drills are long and quite narrow (Table 121). Two drills have an additional, opposite edge used as scrapers.

Notched tools (n=2) and *notched scrapers* (n=2) are primarily of rhyolite (n=3), with one silicified wood tool. Notches of all four tools are formed by the unidirectional, unimarginal removal of one or two flakes, which exhibit unidirectional scarring within the concavity. If wear was absent in the notch, it was not classified in this group, since it cannot be conclusively stated that the concavity represents a finished tool. Two tools were used as scrapers on opposite edges. Notch edge angles are 55, 60, 65, and 70 degrees, and scraper edge angles are 45 and 50 degrees. Dimensions of the complete tools are in Table 122.

Two complete *choppers* are formed from large, thick rhyolite flakes and exhibit crushed edges measuring 60 and 70 degrees (6.0 by 4.9 by 1.9 cm and 9.0 by 7.7 by 2.5 cm). The 60 degree chopper is unimarginally retouched along the used edge. The third chopper appears unfinished. It is formed from a large thick basalt flake which is bimarginally retouched along one irregularly contoured edge (14.5 by 11.3 by 3.9 cm). No wear is present.

The *retouched cobble tool* is an oblong quartzite cobble that is unimarginally retouched at one end, over which rounding and abrasion wear are present. Retouch, in this case, was intended to sharpen, rather than blunt, the edge of the cobble. Wear on this retouched edge indicates use more in the manner of a ground stone tool than one of chipped stone.

Tools in the *indeterminate marginally retouched* (n=19) category are unfinished or too fragmentary for functional assignment. They include flakes and angular debris which have been unimarginally or bimarginally retouched along an edge or a portion of an edge. Use-wear is virtually absent on these tools (two exhibit wear) whose edge angles range from 25 to 80 degrees, with the majority clustering in the 50 to 65 degree range. Tools in this category appear to have been broken during manufacture. Durable and brittle materials are nearly equally represented in this indeterminate group; with rhyolite (n=7), basalt (n=1), siltstone (n=1), and quartzite (n=1) comprising 53 percent and chert/chalcedony (n=6), silicified wood (n=2), and obsidian (n=1) making up the remaining 47 percent. The obsidian tool is a triangular flake with one unimarginally retouched edge, which appears to be a blade tip fragment from an unfinished point (1.5 by 0.8 by 0.2 cm). One other anomalous tool in this group is a small chalcedony pebble (2.8 by 1.8 by 1.1 cm) which is unimarginally retouched at one end to a 55 degree angle and exhibits unidirectionally scarring, presumably from scraper-type use.

Formal tools (n=29) include unifaces (n=5), biface fragments (n=12), unfinished bifaces (n=8), and unfinished unifaces (n=4). Facially retouched tools are highly fragmentary and/or unfinished, with only a single complete specimen present, a rectangular rhyolite uniface. Of those whose shapes can be determined, eight are subtriangular, and eight are subrectangular. Four exhibit facial retouch originating from a single edge and extending at least one-third across the face. Facially retouched tools are primarily of brittle materials such as chert/chalcedony (n=15), silicified wood (n=2), and obsidian (n=1). Durable materials such as rhyolite (n=9) and basalt (n=2) are fewer in number. Aside from obsidian, facially retouched tools of all materials have a crude, unfinished appearance. Obsidian was the preferred material for tools requiring facial retouch (e.g., drills, points) as evidenced by the large number of obsidian biface reduction flakes (particularly at LA 5407) and projectile points. This is perhaps to be expected given the poor quality of the vast majority of local chert and chalcedony.

The preceding section has provided descriptive information and probable functional assignments of the Gallo project tools. An attempt is now made to gain subsistence information through material types and accompanying edge angles (cf. the analysis of Mimbres Valley tools in Nelson 1981). Nelson found that the frequency of coarse stone material, cortex edge reinforcement, and relatively steep production edge angles show the extent of prehistoric need for durable edges. Durable edges are presumed to be more suitable for plant processing than animal processing, since edge resistance is more important than edge sharpness (Nelson 1981:11). Therefore, sites that yield high frequencies of steep-angled, durable material tools have greater reliance on gathered and cultivated plant foods than on animal foods. Lithic assemblages with high percentages of acute-angled, brittle material tools indicate higher dependence on animal foods, which require sharp, though brittle, tools for processing. To ensure the tabulation of production edge angles only, Nelson culled all retouched artifacts from her sample, eliminating artifacts that may have been curated. Although retouched tools may be the result of a use/curation/use sequence, it may also be that tools with retouched edges were manufactured prior to use and thus have a differently manufactured production edge angle. For these reasons, both tool groups are examined: unretouched, unmodified tools, and both retouched and unretouched tools.

To determine the relative percentages of steep angled/durable material tools versus sharp angled/brittle material tools, both materials and edge angles were grouped, with durable materials consisting of rhyolite, basalt, siltstone, and quartzite. Brittle materials consist of chert, chalcedony, silicified wood, and obsidian. The dividing point between "steep-angled" and "sharp-angled" was set at 40 degrees after Nelson's (1981:184) findings that "the temporal shift in tool selection appears to be between the tools with production edge angle values greater than 66 degrees and those with angle values of 19 to 40 degrees. However, angles of 40 degrees and greater have been used as knives in experiments (Ahler 1971) and observed in Australian Aborigine tool use (Gould et al. 1971), giving this division an admittedly arbitrary basis. The percentages of each of the four material/angle groups were then calculated for each site (Table 123).

Based on Nelson's results for the Mimbres area, the percentage of steep-angled, durable tools should increase through time, with early sites showing small percentages, and later sites showing larger percentages. Sharp-angled, brittle tools, on the other hand, should decrease through time, with the highest percentages occurring in the earlier sites. While these relative percentages of tools types do occur in some sites (LA 14908, LA 14909, and to a lesser extent LA 6075), some sites yielded the opposite. For example, LA 5407, an Early Pithouse period site, and one of the earliest sites on the project, has high percentages of the steep-angled/durable tools used in plant processing and much smaller percentages of the sharp, brittle tools used for animal processing. Though the preponderance of plant-processing tools is unexpected in a site of this early period, the ground stone tool assemblage from LA 5407 would support the importance of cultivated plant dependency at that site. Assemblages that went totally against the expected trend were from LA 14858 and LA 6076. LA 14858, in particular, an Early Pueblo period site, has an extremely small percentage of durable plant-processing tools and much higher percentages of animal-processing tools.

Perhaps at this point it can be argued that steep-angled tools of both durable and brittle materials can be combined to give a more accurate representation of the degree of dependence of plant verses animal foods. If this is done with LA 14858 and LA 6076, they cease to be anomalous and instead show plant-processing tools in the majority, as expected in Early Pueblo period sites.

The degree of brittleness of the various crypto-crystalline materials needs to be examined more closely for these material combinations to be made, since the difference between the dense, black Apache Creek chert and the extremely brittle obsidian is considerable. Even the silicified wood at these sites is brittler than the local cherts. If the less brittle chert tools are combined with durable material tools such as rhyolite and basalt, based on the assumption they are functionally identical, sites which appear anomalous in their low percentage of plant-processing tools "fit in" to the expected pattern. However, assuming their subsistence base is similar to that of other contemporaneous sites, these contrasting sites may be explained in other ways: off-site plant processing, the greater availability of chert over durable materials, or small sample size (LA 14858 only). In keeping with the above argument, the rhyolite, classified as a durable material, possesses characteristics similar to those of brittle materials in its ability to fracture along very sharp edges as low as 15 degrees. Rhyolite may have proved the ideal knife, both sharp and durable. This is perhaps best evidenced by the high percentages of rhyolite in the knife tool group. Thus, the subjectivity of material type function and the need for concurring wear pattern analysis is apparent.

The three multicomponent sites (LA 14906, LA 14920, and LA 14930) are difficult to analyze. Two of these sites have possible Archaic components based on the presence of one San Pedro projectile point each. LA 14906, in addition, has an usually high occurrence of bifacial reduction compared to other project sites. Since the lithic artifacts cannot confidently be assigned to a particular component, analysis of Table 123 data is subjective. Another major factor in dealing with these sites is the small samples of LA 14930 (n=3) and LA 14920 (n=19). LA 14906 has an adequate sample, but it cannot be considered anomalous in the high percentage of durable, steep-angled tools since component assignments cannot be made for the lithic artifacts, except the possible Kent projectile point.

The above discussion is based on the material/edge angle group percentages of unmodified tools only, after Nelson's study. If retouched and unmodified tools are combined and grouped into the same categories, steep, durable-edged tools constitute higher percentages than brittle-edged tools, even for those sites in which durable tools are in the minority for the unmodified group. Retouch steepens an edge considerably, and since it is most often performed on durable materials, the difference in the relative tool group percentage of Table 123 is to be expected. It does, however, result in a slightly more consistent trend of increase in durable, steep-edged tools from the earliest sites to the latest. The two sites with the archaic components are comparably lower in durable tools than the later sites.

The fact that neither the unmodified nor the combined tool assemblages show the expected trend of a gradual increase in durable tools and/or a decrease in brittle tools may be explained by a number of factors. First, the time span represented the Gallo project sites, while of comparable length to the Mimbres Valley sites of Nelson's study, contrasts with hers in that it is clustered at the later end of the sequence. The time periods represented do not provide a continuum over which trends can be accurately observed. Also, greatly contrasting numbers of tools from the various sites skew the percentages.

Second, it would seem that the availability of various lithic materials would be an influencing factor in the materials selected for tool use. This may be of minimal influence in the Largo Canyon sites, since materials of contrasting character are all locally available. Relative availability may be a factor. For example, rhyolite is restricted to a single quarry source, whereas chert and chalcedony outcrop in various locations within Largo and Apache Canyons, perhaps greatly increasing the availability of those materials at some sites.

This in turn leads to another factor, the gradation of textures that occurs within the two gross categories of durable and brittle, with "durable" rhyolite having some of the sharp qualities of brittle materials, and the "brittle" Apache Creek chert having some of the resistant qualities of durable materials. Materials of these combined characteristics can perhaps challenge the sharp functional division of all lithic materials into durable plant-processing tools and brittle animal-processing tools, suggesting that a gradation of material qualities from brittle to durable is more realistic. In addition, the natural tendency of crypto-crystalline, or fine-grained, materials to fracture along sharp, thin edges and that of crystalline, or coarse-grained, materials to fracture along less acute edges no doubt affects the choice of materials to be used for certain tools and tasks. Natural fracture tendencies of certain materials may be a major influencing factor in the distribution of edge angles among tools, particularly among unmodified tools. Although this does not negate the manufacture of specialized tool types, these natural tendencies must be taken into account, particularly with materials that fracture consistently within a certain angle range, or for those which fracture within a wide angle range, such as rhyolite.

Finally, the fact that major trends were not found over time in the project sites may be taken as a conclusion in itself. It may indicate a greater reliance on hunting than has been assumed for the later, Early Pueblo period sites, and that little change in relative reliance on plant versus animal foods occurred from the Early Pithouse through the Early Pueblo periods. What can be conclusively stated is that sites with higher percentages of tools and debitage of brittle materials also have higher percentages of tools of those materials, as well as higher or equal proportions of sharp-angled tools, both modified and unmodified (see LA 14930, LA 6076, and LA 14858 in Table 124).

The inverse trend also holds true: sites with higher percentages of durable materials have higher percentages of tools of those materials, as well as higher or equal proportions of steeply angled tools. In other words, there appears to be a direct relationship between tool edge angle and material type, but whether this is the result of natural fracture tendencies, the manufacture of specialized tool types, or a combination of both must be determined before site activities can be hypothesized based on that relationship.

Phase 3 Analysis by Site

LA 5407

LA 5407 yielded the largest sample of lithic artifacts of sites in the project area (n=848). The assemblage consists of 725 pieces of debitage (586 flakes, 139 angular debris), 96 tools, 17 cores, and 10 hammerstones. The lithic assemblage is distinctive in that an impressive 36 percent (n=300) of the entire assemblage was burned (as with rhyolite and igneous materials), overexposed to the point of fire-popping (as with chert, chalcedony, and silicified wood), or fused (as with obsidian). Less than 2 percent (n=14) is heat treated. The lithic artifacts were exposed to heat during the fire, which burned the structure and its antechamber. The debitage frequency was increased substantially from the excessive spalling of cores left on the floor during the fire. These spalled "flakes" affect the analysis not only by increasing that frequency but by overrepresenting the ridge "platform" characteristic of these flakes.

The percentage of tools from LA 5407, unexpectedly low compared to other, smaller sites in the project, was probably affected by the fire (Table 125). Given the large size and undisturbed nature of LA 5407, the tool percentage is low. However, if a third of all site debitage is the result of fire spalling, the tools percentage would be considerably higher. Tool condition is affected by heat overexposure, because over one-third (34 percent; n=10) of all fragmentary tools are burned or fire-popped.

The site tool assemblage (Table 126) is characterized by a high percentage of unmodified, steep-angled tools of durable materials (51 percent; n=33) thought to be associated with plant processing. Rhyolite is the largest material type at the site (Table 127).

The high percentage of obsidian is unique to LA 5407. The vast majority of this obsidian (82 percent; n=108) is from the fill of the antechamber in the form of biface or early biface manufacturing flakes. These flakes are remarkably uniform in size and morphology. They are quite small and of clear gray (Red Hill) or silvery gray (Mule Creek) obsidian (mean dimensions of 62 complete flakes, 1.3 by 1.1 by 0.2 cm). Their presence in the fill and roof fall strata indicate a rooftop working area above the antechamber and possibly the main chamber. Obsidian biface manufacturing flakes, in fact, represent most of the facial reduction occurring at LA 5407, since facially reduced tools comprise a negligible portion of the tool assemblage (excluding points) and account for the highest percentage of those flakes from all project sites (8 percent of typed flakes for LA 5407; Table 128). Obsidian comprises a considerably larger portion of the LA 5407 assemblage (15 percent; n=131) than in the other sites (3 percent maximum). The single obsidian core from the project is from LA 5407.

Core frequency (n=14) was also expected to be higher for LA 5407. This may be due in large part to off-site reduction of rhyolite (7 cores), which may result in blanks rather than cores being transported to the site. Again, cores in floor contact were exposed to fire, which in some cases made analysis difficult, and in one case impossible. Some cores may have gone unrecognized as such, given the highly fragmented nature of two cores from the structure. Core type distribution is shown in Table 129.

Ten hammerstones were found at the site, eight of which are quartzite cobbles, and two of which are Apache Creek chalcedonic geodes. All of the quartzite and one geode hammerstone are battered on one or both ends and/or around the perimeter. One geode cobble is battered over the entire surface. Mean dimensions of the eight complete specimens are given in Table 130.

LA 5407 yielded more hammerstones than any other site, with LA 6076 a close second (n=7). Hammerstones were found in the main chamber (n=7), antechamber (n=1), strip zones (n=1), and Feature 26 (n=1).

Of the seventeen projectile points recovered, 12 are small, diagonally notched, and typed as Scallorn-like points (Fig. 99a-99e). One is a leaf-shaped point (Fig. 99f), one a large, stemmed, concave-base point (Fig. 99g), one a small, serrated, stemmed point (Fig. 99h), one is diagonally notched with a contracting base (Fig. 99i), and one an unfinished obsidian point. Detailed descriptions of the site projectile points are provided in the projectile point section.

The tool distribution is given in Table 131. Within the structure, a notable 33 percent (n=140) of lithic artifacts were found in the floor-contact layer, including posthole fill, vessel fill, floor drum fill, and subfloor levels. The remaining 67 percent (n=288) of the lithic assemblage was found in floor fill (n=198) and general fill (n=90).

Floor-contact lithic artifacts are nearly all debitage (93 percent; n=131) with a mere seven tools and two cores. This debitage probably originated from spalling, heat-fractured cores and/or tools, or fell to the floor from the rooftop working area when the structure burned, because it is doubtful that the floor have served as a knapping area. Tools found in floor contact include five scrapers (one subfloor), a shaver, and a knife.

A total of 34 mineral samples were recovered from the site. Mineral types and the provenience distribution are listed in Table 132. Except for the hematite found in strip zone Feature 22, no grinding wear or other cultural modification is present on any of the specimens except for burning. Three hematite specimens from the main chamber and antechamber are burned and fire-cracked (one from the floor, two from floor fill levels), as is the mica sample (floor-fill level).

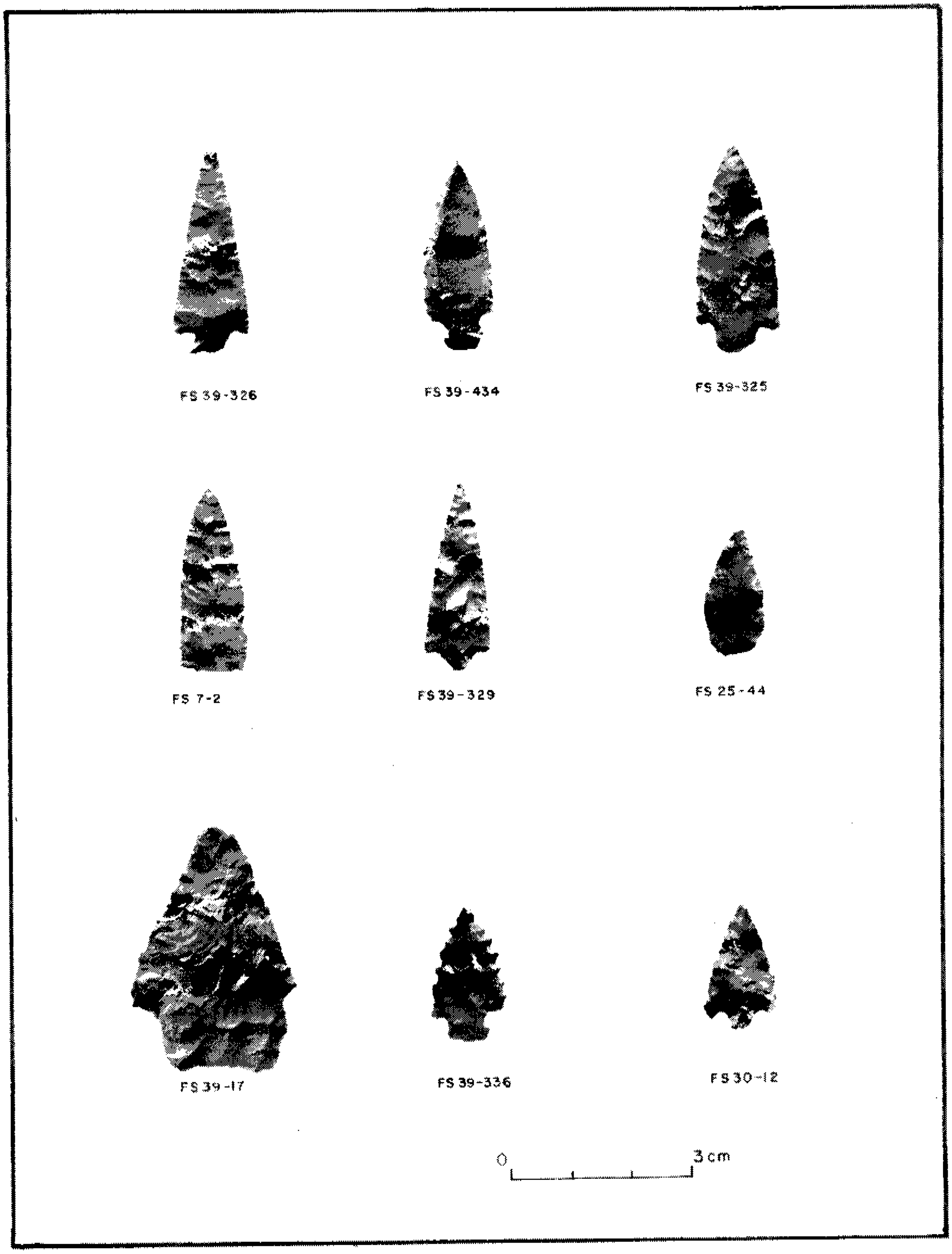

Figure 99. Projectile points, LA 5407.

The site assemblage contrasts with that of other project sites in the high percentage of obsidian and obsidian biface manufacturing represented. Although a large variety of tool types are present, the tool percentage is low and may be affected by the burning of the structure. This burning also had a significant effect on debitage and platform type frequencies, particularly with rhyolite cores and flakes. LA 5407 is also the site which best illustrates the partial quarry reduction of rhyolite and on-site reduction of other materials, particularly local chert and chalcedony. Rhyolite is also by far the preferred material for tools despite the wide range of tool function at the site.

LA 6074

This site contained two lithic artifacts, one rhyolite and one basalt flake.

LA 6075

This assemblage consists of 139 pieces of debitage (120 flakes, 19 angular debris), 33 tools, and 7 cores, a total of 179 artifacts. Lithic materials are nearly evenly distributed between durable and brittle types (Table 133). This site has the highest percentage of silicified wood of sites in the project (13 percent) as well as one of the higher tool percentages (18 percent; n=33) (Table 134). The tool assemblage is dominated by durable, steep-edged tools and is one of the sites which fit into the expected pattern of increased percentages of these tools for later sites.

The seven cores fall into three categories (Table 135). Silicified wood cores are a rare occurrence in the project sires. LA 14906 yielded the only two additional cores of this material in the project.

Lithic artifacts are primarily from test pits and test trenches (n=71 and n=17, respectively). The pit structure (Feature 16) yielded the highest frequency of any single feature (Table 136). A unifacially reduced tool was the only lithic artifact found in floor contact in the entire site.

Of the two projectile points (Figs. 100a and 100b), one is a complete obsidian point with side notches and a straight base, and the other is a diagonally notched point with a parallel-sided, straight base narrower than the shoulders. Point descriptions are provided in the projectile point section.

LA 6076

The lithic assemblage consists of 477 pieces of debitage (420 flakes, 57 angular debris), 101 tools, 37 cores, and 9 hammerstones, a total of 624 artifacts. Rhyolite and chert/chalcedony are nearly equally represented (Table 137). The site is notable for the absence of obsidian and a comparatively high percentage of silicified wood for the project area. The distribution of tool materials and edge angles does not conform to the expected trend of high percentages of plant-processing tools for later sites.

Tools comprise one of the larger percentages of the total assemblage among project sites. A wide variety of tool types are present, though durable and brittle materials are fairly equally represented among tools compared to other sites. Brittle materials such as chert, chalcedony, and silicified wood comprise a far greater percentage of tool use, and this is reflected in the distribution of functional types (Table 138).

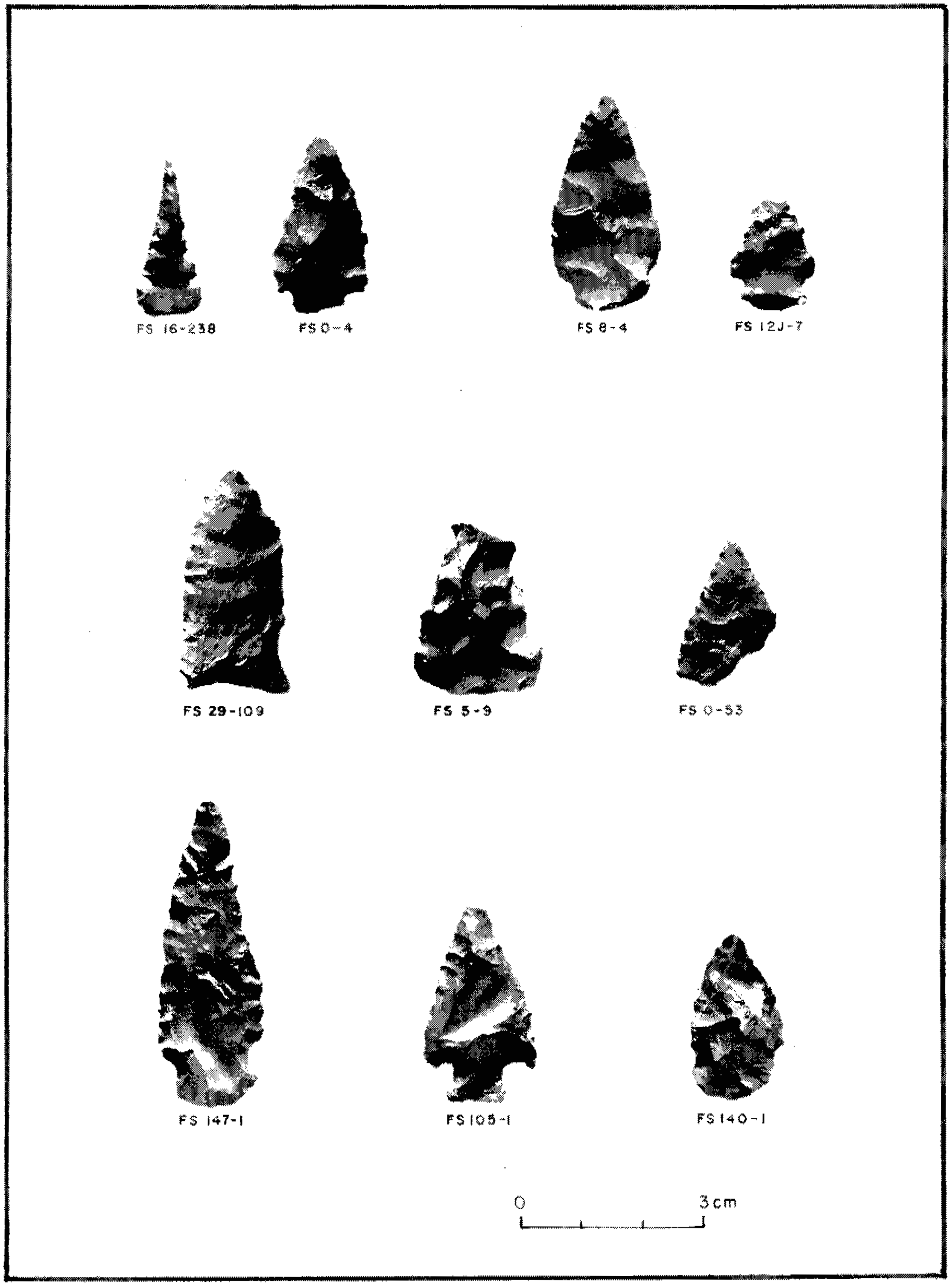

Figure 100. Projectile points: (a-b) LA 6705; (c-g) LA 6706; (h-j) LA 14906.

Activities involving acute-edged tools and steep-edged tools are nearly evenly represented but are not limited to one type of material. Knives, for example, are distributed across a range of material qualities. Durable rhyolite, igneous, and quartzite outnumber the brittle chert/chalcedony and silicified wood. As mentioned in the discussion, this range of angles and wear patterns among material types is probably due at least in part to the versatility of two particular material types in the area, rhyolite and Apache Creek chert.

LA 6076 yielded the highest core frequency of any project site, though not the highest core percentage. The core type distribution is listed in Table 139. As noted in the case of other project sites, rhyolite cores exhibit higher percentages of multiple platforms than chert/chalcedony cores. Partial quarry reduction of rhyolite is believed related to the higher occurrence of multiple-platform cores among project sites.

Of the eight projectile points, two are Scallorn-like, two have an expanding base narrower than the shoulder with straight to convex bases (Fig. 100c and 100d), one is a Bat Cave point (Fig. 100e), two are unfinished (Fig. 100f), and one is fragmentary (Fig. 100g). Descriptions are listed in the projectile point section.

Among the six gross provenience categories, lithic artifacts are fairly evenly distributed (Table 140). However, within these groups, one pit structure (Feature 59) and two rooms (Features 29 and 57/58) yielded the highest lithic frequencies. It is not certain if lithic artifacts are densest in the room area because of the large room size or the fact that the architecture is concentrated there.

Lower but not insignificant numbers of lithic artifacts were found in two pit structures (Features 28 and 60) and one room (Feature 31). As might be expected, within rooms and pit structures, the vast majority of lithic artifacts are from the fill and floor fill levels (n=226; 87.5 percent), with a mere 7 percent (n=18) found on the floor. Subfloor levels yielded 14 lithic artifacts (5 percent). Eight tools were found in floor proveniences and consist primarily of knives (n=4), scrapers (n=2), a drill, a biface fragment, and an indeterminate tool. LA 6076 is unusual in that lithic artifacts are found primarily in the room and pit structure area, with frequencies dropping off in the excavated areas around the rooms. However, due to excavation methods and feature depth, artifacts listed as originating inside rooms and pit structures may have actually come from the areas immediately exterior and adjacent to the structures. These exterior working areas or rooftop working areas may explain the high debitage frequencies in the structures.

LA 14858

The lithic assemblage consists of 25 pieces of debitage (24 flakes, 1 angular debris), 25 tools, 3 cores, and a hammerstone, a total of 54 artifacts. The material distribution is given in Table 141.

LA 14858 is distinctive for the paucity of lithic artifacts, especially considering the large number of ceramics and the presence of architecture. Even more remarkable is the extremely high tool percentage (46 percent). Considerable off-site reduction may explain the paucity of debitage, with partially reduced blanks being transported to the site. The paucity of debitage and high tool percentages are probably a result of the location of the trash deposits. The middens, downslope from the site proper, were not excavated and may contain the majority of the debitage. Tools, on the other hand, would be expected to originate on-site, explaining their high percentages for the site proper. Although retouch modification is high (n=7; 28 percent), the debitage at the site is in general too large to have resulted from the final phases of facial reduction; therefore, some initial core reduction and tool manufacture must have taken place at the site, however small (Table 142).

Tools are nearly evenly distributed between plant- and animal-processing types (Table 143). Durable, steep-angled tools were expected to dominate the assemblage given the comparatively late date of the site. Some possible explanations for the reverse trend are offered in the discussion.

Of the two chert cores, one is a single-platform core, and one is a two-parallel-platform core. The rhyolite core exhibits two adjacent platforms. The single quartzite hammerstone measures 10.1 by 8.9 by 7.6 cm. The single projectile point is an unfinished, crudely made, leaf-shaped point of clear gray, banded obsidian. A detailed description is provided in the projectile point section.

Phase 2 Analysis by Site

Phase 2 analysis methods concentrated on debitage reduction stages. Interesting contrasts exist in the percentages of individual stages among material types from site to site. These contrasts appear to support the theory that rhyolite was partially reduced at the quarry site and chert/chalcedony was reduced mainly at individual sites. Unfortunately, the small sample size from many sites affects percentages. But the greater range of primary flake percentages for chert/chalcedony (0 to 67 percent) over rhyolite (4 to 50 percent) supports the hypothesis that rhyolite was partially reduced at the nearby quarry site and that chert/chalcedony was reduced on-site. It might then be expected that tertiary flake percentages would be higher for rhyolite, since the material would arrive at the site in the form of blanks, which would then be reduced further, creating higher proportions of secondary and tertiary flakes. In fact, this is not the case (Tables 144 and 145), since the range of tertiary rhyolite flakes is lower than that for chert/chalcedony (0-24 percent for rhyolite, 0-27 percent for chert/chalcedony). The slightly lower occurrence of tertiary rhyolite flakes is probably related to the large, unmodified flakes used as tools with this material, as opposed to the formal tool reduction occurring with chert/chalcedony materials.

LA 6077

This site assemblage consists of 10 pieces of debitage (9 flakes, 1 angular debris) and a tool, a total of 11 artifacts. Material types are distributed as shown in Table 146. The single tool is a small chalcedony flake exhibiting two utilized edges.

LA 14463

One chert cobble measuring 5.3 by 4.2 by 4.0 cm was found 20 cm below the surface. No modification is present.

LA 14882

The assemblage consists of 17 artifacts: 11 pieces of debitage (8 flakes, 3 angular debris) and 6 cores (Table 147). Durable materials outnumber brittle materials among the debitage, as with cores (Table 148).

The absence of tools, the paucity of debitage, and high core frequency are unusual characteristics of the assemblage. Tools may have been transported from the site and cores stored for future reduction. The low debitage frequency indicates little tool manufacture and core reduction activity. Lithic artifacts were recovered entirely from Strip Zones 0, 2, 3, 4, and 6 (n=1, n=2, n=12, n=1, and n=1, respectively), with no direct feature associations.

LA 14906

This site assemblage consists of 820 pieces of debitage (724 flakes, 96 angular debris), 44 tools, 13 cores, 6 hammerstones, and 5 projectile points, a total of 888 artifacts. Debitage constitutes the great majority of the assemblage (92 percent). All stages of core reduction and tool manufacture are represented (Table 149). Secondary and tertiary stage flakes are the most numerous debitage types. Almost equal numbers of core fragments and angular debris are present. Rhyolite and chert are the most intensively utilized material types. Those two types, as well as Apache Creek agate, chalcedony, and basalt exhibit all of the reduction stages. The lack of tertiary flakes in several materials may represent their use for larger, less modified tools, the degree of reduction occurring off-site, or the size of the parent material for those lithic types.

The 13 cores found at the site are distributed among four material groups (Table 150). Unusual in the core assemblage is the domination of single-platform cores for durable materials and the high percentage of two-platform cores for brittle materials. Rhyolite and igneous cores are large and not reduced as extensively as brittle material cores. The increased preference for chert and chalcedony at the site compared to most other project sites is also reflected in the tool assemblage by a small margin.

The tool assemblage (n=44) is nearly equally distributed between durable, steep-angled tools and brittle, sharp-edged tools. LA 14906 is a multicomponent site, and the lithic assemblage appears to be part of the earlier, Archaic component. The comparatively high percentages of brittle/acute edged tools and the high occurrence of bifacial retouch are evidence of the Archaic time period. Although biface reduction flakes were not recognized in the original analysis, tertiary stage flakes were, and they comprise the third highest percentage of Phase 2 analysis sites.

A low variety of tools types was found, only four of which are functionally determinate (Table 151). Facially reduced tools are all either fragmentary or unfinished, leading to their indeterminate function. Retouch modification on other tool types is not uncommon (n=9; 20 percent) and occurs both on chert/chalcedony and rhyolite. However, on scrapers, retouch is present only on chert specimens.

Hammerstones are basalt (n=3) or quartzite (n=3) cobbles exhibiting battering wear on the ends and/or perimeters. A considerable size range is represented among the five complete specimens (Table 152).

Five points were recovered from the site. These include a Kent-like point of the type most commonly associated with prepottery dates (Fig. 100h), a large, diagonally notched point with an expanding straight base narrower than the shoulder (Fig. 100i), and a parallel-stemmed point with the straight base narrower than the shoulder (Fig. 100j). Descriptions of the above points are provided in the projectile point section.

Lithic artifacts were concentrated on and around two use-surfaces (Features 38 and 35) (Table 153). They are from shallow fill (0-15 cm bs) and almost exclusively outside the surfaces, with an estimated 10 percent of lithic debitage originating from fill (lack of provenience information precludes exact placement). The densest exterior concentrations are directly adjacent to the use-surfaces on the west side in strip zones Features 4 and 5 (west of Feature 38) and strip zones Features 16 and 17 (west of Feature 35). Lithic artifacts are nearly completely absent from the surfaces' north and east sides, even where firepits are located. The two isolated firepits between Features 38 and 32 (Firepits 30 and 48) are included in Feature 38 and vicinity and yielded about 10 percent of the lithic artifacts from that general provenience. Feature 31 is unusual in the absence of associated lithic artifacts.

Tools contrast with debitage in that 23 percent (n=10) were recovered from Features 38 and 35 fill (n=8 and 2, respectively). Outside these features, tools are mainly restricted to within 6 m of the features, but rather than being clustered on the south and west sides, they are also present in considerable numbers on the east side of Feature 38 (n=12), with one tool found in Feature 40. Feature 38 fill also contained a core, and an additional five cores originated from the immediate exterior. Of the three points found near Feature 38, two were recovered from the same 2 by 2 m grid (strip zone Feature 8, 18-20 m north) on the southeast corner, and one from strip zone Feature 5 on the west exterior.

The lithic assemblage of LA 14906 possesses contrasting aspects that make temporal assignments difficult. The high percentage of tertiary-stage debitage and formal tools are characteristic of an earlier component. Informal tools, on the other hand, while dominated by steep-angled types, are primarily of brittle materials and thus not particularly characteristic of an early or late component. The combined traits of high bifacial reduction and the use of brittle materials for tools seem to outweigh the steep-angled aspect of the tool assemblage, particularly since sharp-angled tools are far from unrepresented.

LA 14907

The assemblage is comprised of 18 pieces of debitage (17 flakes, 1 angular debris), 7 cores, and 3 tools, a total of 28 artifacts. The debitage is nearly evenly distributed among brittle and durable materials (Table 154). Secondary-stage flakes make up 50 percent of the debitage, and all other stages of reduction are nominally represented. Chert/chalcedony is the only material type represented by all three reduction stages, an occurrence believed to be related to the transportation of this material to the site in unmodified form.

Cores (n=7) are primarily of durable materials (Table 155). The chert core with two parallel platforms is a large core fragment with subsequent flake removals from the dorsal surface. Some of the dorsal flake scars appear to have been detached through use of the core as a hammerstone prior to the detachment of the core fragment. Both chert cores exhibit internal fractures, which have resulted in large numbers of hinged flake scars. The predominance of single-platform cores for durable materials is not common among project sites and may indicate a basalt outcrop close to the site. The remaining cortical surface of the basalt cores has the smooth, rounded cortex of river cobbles. Basalt cores range considerably in weight (range 41-641 g) and material quality, from a slightly vesicular to a dense, cherty texture. The rhyolite core is also a large core fragment with flake removals made subsequent to detachment of the core fragment. Unidirectional scarring wear along three-quarters of the perimeter indicates use as a scraper.

A single chalcedony scraper exhibits unidirectional scarring along one unretouched, 60 degree edge. The complete scraper measures 4.4 by 2.3 by 1.3 cm. Two large basalt tools are functionally indeterminate. One basalt tool is a tabular fragment which has been unimarginally retouched along two edges of a roughly rectangular form (70 degrees). Slight grinding wear, presumably to smooth and shape the tool, is present on one flat surface. No hafting element is present, and the retouched edge shows no evidence of wear. The second basalt tool is a possible hoe. It is formed from a flat, rectangular basalt cobble exhibiting two flake removals at the "bit" end and a few larger flake removals on either side of the cobble's midsection. Whether the bit end flake scars are the result of shaping or were detached during use is unknown. The midsection flake scars appear to be hafting element notches.

Lithic artifacts were all recovered from shallow fill (0-10 cm below surface) in or around the masonry structure (Feature 20) or within 2 to 4 m south of the structure (Table 156). Two lithic artifacts, one flake and one basalt tool, were found inside the structure (Feature 20), while the other eight lithic artifacts were recovered from the room's exterior. Of interest is a concentration of cores in the trash area north of Feature 20, particularly since there is little associated debitage (4 flakes). It seems unlikely that all six cores were discarded considering the large size of three of the cores. No work area is indicated because there is a lack of debitage. The four debitage flakes are of four different material types. The cores were placed there with future work in mind or simply eroded downslope from the exterior work area to the south.

LA 14908

The assemblage consists of 217 pieces of debitage (179 flakes, 38 angular debris), 49 tools, 10 cores, a hammerstone, and 2 projectile points, a total of 279 artifacts. Although the debitage is dominated by secondary-stage reduction flakes, percentages within each material group vary considerably (Tables 157 and 158). Rhyolite exhibits comparatively high percentages of secondary and tertiary flakes, an indication that the material was partially reduced at the quarry. Chert/chalcedony, on the other hand, while also a local material, appears to have been transported to the site in nodule form, as evidenced by slightly higher percentages of primary flakes and lower percentages of secondary and tertiary flakes. The high percentage of angular debris for chert/chalcedony is doubtless related to the poor quality of much of this material.

Five core types are represented, and durable materials comprise the majority (Table 159). Multiple platforms have low representation among durable material types, which is not the case at most project sites. The prevalence of one- and two-platform cores may indicate the reduction of cores into tools rather than the production flakes to use as tools. The high frequency of durable material cores is in accordance with that of the tool assemblage.

Six tool types were recognized, and durable materials dominate the tool group (Table 160). The overwhelming dominance of durable-material tools is reflected again in the preponderance of steep-angled, durable tools (40 percent) over sharp-angled, brittle tools. This predominance of plant-processing tools was expected for Early Pueblo period sites in the project, but this did not occur at all sites of that phase. Other characteristics of the tools assemblage at this site include an extremely low incidence of retouch modification and a complete absence of facial retouch. Tools are typically large, unmodified flakes of durable materials.

Unusual tools from the site include a complete chert drill, modified into an elongated projection by unimarginal retouch. Both the edges and end of the projection are rounded from use (4.1 by 2.5 by 1.2 cm). The possible hoe is a thin, tabular basalt slab which is chipped around three edges (one broken) into a subrectangular shape. The three unbroken edges are heavily rounded and polished from use, and grinding wear is present on the two flat opposing surfaces. No hafting notches are apparent. Both projectile points are diagonally notched with contracting

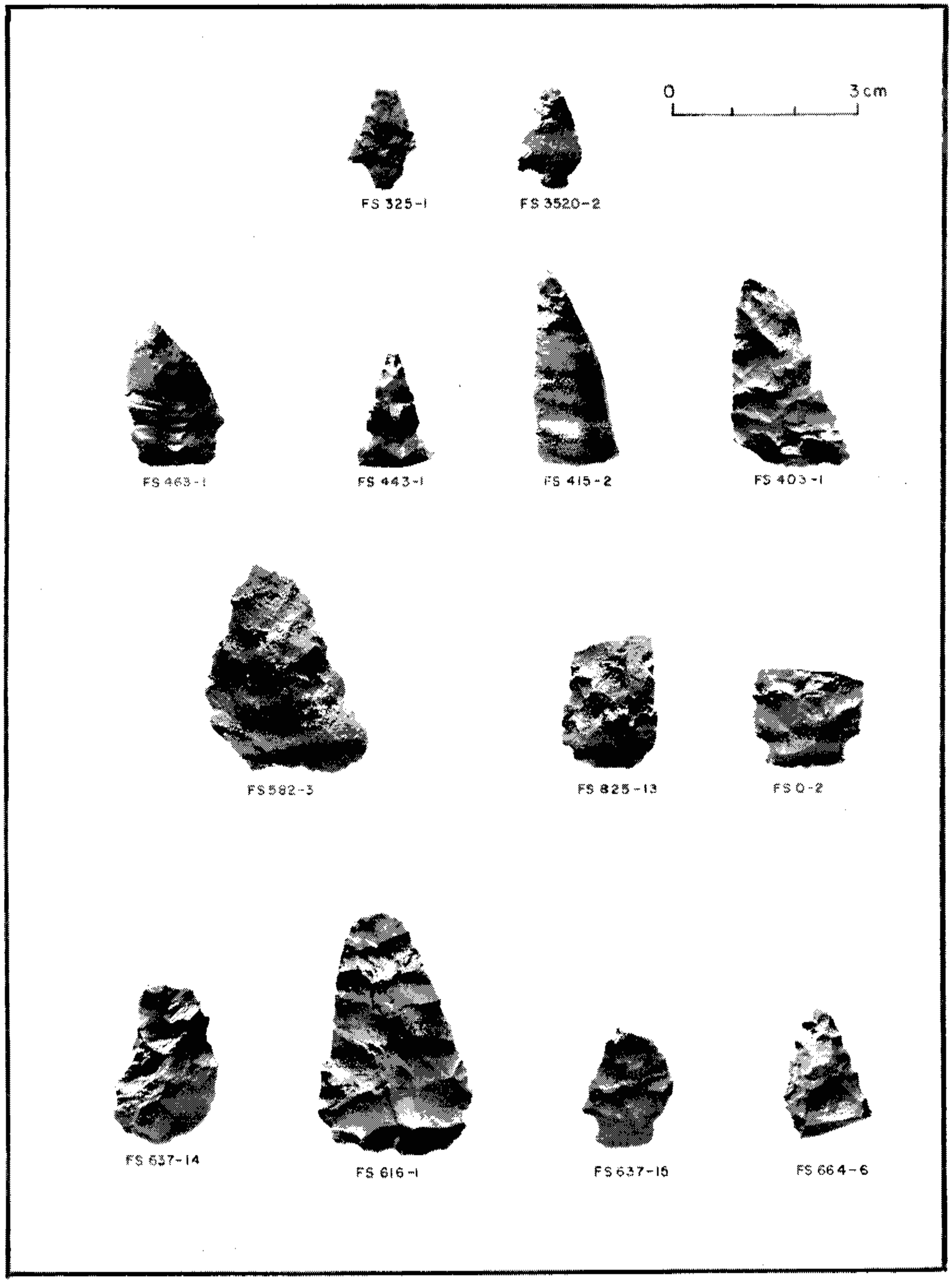

Figure 101. Projectile points: (a-b) LA 14908; (c-f) LA 14909; (g) LA 14917; (j-m) LA 14930.

bases (Figs. 101a and 101b). Descriptions are provided in the projectile point section.

Lithic artifacts are distributed almost exclusively within a triangular area (n=229; 82 percent), the apex of which is in Features 15 and 16 (16-18 m east) and expanding west across Features 6-16 (2-4 m east). Within this triangular area, tools, cores, and debitage are concentrated in Features 14 and 15 from 8 to 14 m east. This fan-shaped distribution is the result of lithic artifacts eroding downslope. The westernmost lithic artifacts originated closest to the surface (0-10 cm below surface), and the upslope, easternmost material originated from deeper fill (10-20 cm below surface).

LA 14909

The assemblage consists of 100 pieces of debitage (89 flakes, 11 angular debris), 14 tools, 3 cores, 4 projectile points, and 19 unmodified nodules of Apache Creek agate, a total of 121 artifacts. Typical of project sites, rhyolite and chert/chalcedony are the dominant material types (Table 161). All three reduction stages are present with those materials, yet rhyolite exhibits a considerably higher percentage of primary-stage debitage than chert/chalcedony, an unusual occurrence among debitage analyzed for reduction stage. One other Early Pueblo period site, LA 14882, also shows higher percentages of primary-stage reduction with rhyolite than with chert/chalcedony. For all other sites, however, regardless of period, rhyolite is lower in primary stage material than chert/chalcedony, a trait perhaps caused by the partial reduction of rhyolite at the quarry source and the transportation of chert/chalcedony in nodule form to the sites. This is also evidenced in the core-type distribution of these materials.

The tool assemblage (n=14) is overwhelmingly dominated by scraping and chopping tools of durable materials, with indeterminate tools exhibiting edge angles of at least 40 degrees (Table 162). Rhyolite and quartzite tools are of large, minimally modified, or unmodified flakes. The single rhyolite knife is the exception. Chert/chalcedony tools are more often modified by retouch (3 of 4) than those of rhyolite, although they are functionally similar.

Of the two rhyolite cores, one exhibits a single platform, and one exhibits three platforms (two adjacent platforms and a single platform). The third core is black Apache Creek chert and exhibits two adjacent platforms. The 19 nodules of Apache Creek agate (combined weight 520 g) are presumably raw material for tool manufacture and/or hammerstone use, because geode hammerstones are found at one other project site (LA 5407).

Of the four points, one is leaf shaped (Fig. 101c), one is a small, side-notched point with a straight base (Fig. 101d), one is unfinished (Fig. 101e), and one is too fragmentary for classification (Fig. 101f). Detailed point descriptions are provided in the projectile point section.

Lithic artifacts are divided among five different provenience groups (Table 163). Rooms are nearly devoid of lithic material, and the few that are present originated in the fill. The sole exception to this is the projectile point from the floor of Feature 15 (Fig. 101d). The outside work areas, while slightly higher in lithic artifacts than the rooms, still contain a low percentage of the assemblage. About half of the material originated in the fill. The west-side trash areas, though yielding the majority of debitage, tools, and points, may be the result of downslope erosion from work areas (Features 7, 10, and 17). Lithic artifacts are widely dispersed among levels. Levels 24 and 25 yielded the highest numbers. Thus, the levels and features from which lithic artifacts were obtained seem to be minimally related to areas where production was taking place.

LA 14910

The assemblage consists of two debitage flakes, two cores, two tools, and one unmodified basalt cobble, presumably parent material--a total of six artifacts. The two debitage flakes are Apache Creek chalcedony. The two cores, one rhyolite and one basalt, exhibit two adjacent platforms each. The rhyolite core is bifacially reduced along these two platforms. The basalt core exhibits the majority of flake removals from a platform prepared by a single large flake removal.

Of the two tools, one rhyolite flake is unidirectionally retouched along one 45 degree edge. No wear is present on the retouched edge. The second tool is a basalt block which exhibits what appear to be abandoned efforts at retouch. One edge is bidirectionally retouched along a very short portion of the edge, and the opposite edge exhibits one marginal flake removal, whether from wear or retouch is unknown. A third edge is rounded from wear.

Lithic artifacts were from Features 0, 2, 3 and 4 (n=1, n=2, n=2, and n=1, respectively). Both tools and the rhyolite core were recovered from shallow fill within and east of Feature 8 (5-20 cm below surface). The two debitage flakes originate near the surface 2-3 m north of the structures in Features 3 and 4. The basalt core is from the site surface.

LA 14917

The assemblage consists of 13 pieces of debitage (11 flakes, 2 angular debris), a graver, and a projectile point--a total of 15 artifacts. Early and midreduction stages are represented by the presence of primary and secondary stage flakes (Table 164). Rhyolite is the most numerous material type, the flakes possibly originating from one core or flake blank. The flakes of all materials are small.

A single scraper is formed from a large, gray rhyolite flake that exhibits a thick triangular cross section. A portion of one lateral edge exhibits unidirectional scarring from use. The use-edge occurs where a series of flakes have been removed from the dorsal surface prior to detachment of the flake itself, lessening the edge angle there to 55 degrees. The second tool, a possible projectile point preform, is formed from an irregular, triangular black basalt flake which has been facially and marginally reduced on one face and marginally reduced on the opposite face, creating a plano-convex cross section. One rounded "lobe" is present, the other broken off. The "base" is concave. The irregularity of the blade edges give the point an unfinished appearance. The single point (Fig. 101g) is an unfinished basalt point, which is further described in the projectile point section.

Lithic artifacts are distributed among strip zone Features 1, 2, 3, 4, and 6 (n=3, n=2, n=7, n=2, and n=1, respectively). The highest density occurs from 4 to 6 m east (n=7) across Features 1-4. The graver is from strip zone Feature 2 (4-6 m east, 0-5 cm below surface), and the point is from strip zone Feature 3 (2-4 m east, 0-5 cm below surface).

LA 14920

The lithic assemblage consists of 203 pieces of debitage (185 flakes, 18 angular debris), 22 tools, 3 cores, and 2 projectile points, a total of 230 artifacts. The debitage is notable for a fairly equal representation of durable and brittle materials and the relatively high percentage of tertiary-stage flakes (Table 165). Comparable percentages of tertiary-stage flakes are present on two other sites (LA 14930, 26 percent; and LA 14906, 17.5 percent). Generally, the higher the percentage of brittle materials among the debitage, the higher the percentage of tertiary flakes, facially reduced tools, and/or biface reduction flakes. Sites with early components, where lithic artifacts comprise the vast majority of artifactual material, also display the above trend. In contrast with the above, however, tools are primarily of steep-angled, durable materials, and facially reduced tools comprise a small minority. Despite the domination of durable materials among the debitage as a group, tertiary flakes are primarily of brittle materials. The tertiary stage debitage is not reflected in the tool assemblage, however.

Tools are primarily unmodified flakes with steep-angled edges, and formal tools are nearly absent (Table 166). Rhyolite scrapers alone comprise over half the tool assemblage, nearly all of which are large, unretouched flakes with a single use-edge. One unusual, yellow fossiliferous chert scraper fragment is unifacially reduced along a 60 degree edge, which exhibits unidirectional step-fracturing from use. Impurities in the chert appear to have caused breakage. Both the material and the facial reduction of the tool are anomalous at project sites and bear more similarity to Archaic end scrapers. The single formal tool is a large, thick rhyolite flake reduced facially along two steep edges. No use-wear is present, and the tool appears unfinished.

All three cores are small. The two chert cores exhibit a single platform and three adjacent platforms (weights 30 and 57 g, respectively). The rhyolite core is reduced along three edges from a single platform (76 g).

Of the two projectile points, one is leaf shaped (Fig. 101h), and one has an expanding, straight to convex base narrower than the shoulders (Fig. 101i). Complete descriptions are provided in the projectile point section.

The majority of the lithic artifacts at this site came from Features 1-8, though the percentages of artifact classes differ considerably (Table 167). Debitage is concentrated in the dog-leash collection features, in which the majority of tools and all of the cores and points were plotted as isolated artifacts. Both the formal rhyolite tool and the facially reduced scraper were found in isolation.

LA 14930

The lithic assemblage consists of 403 pieces of debitage (349 flakes, 51 angular debris), 9 tools, a core, and 4 projectile points, a total of 417 artifacts. The debitage is dominated by brittle materials (Table 168), a rare occurrence in project sites (also at LA 14858). Tertiary-stage debitage comprises the highest percentage of any project site analyzed for reduction stage, the vast majority of which are brittle materials (26 percent; n=90). Domination of the debitage by a particular material group is typically reflected in the tool group domination (plant verses animal tools), as is the case at this site.

Tools comprise an extremely small percentage of the site assemblage (2 percent; n=9). Half of the tools are fragmentary bifaces (Table 169). The high tertiary-stage debitage percentage, the small percentage of expedient tools, and the high formal tool percentage indicate that formal tool manufacture was occurring at the site in greater proportions than at other project sites. The high formal tool manufacture rate and absence of ceramics suggest an Archaic date, although the projectile points from the site do not support this conclusion.

Two leaf-shaped points, one small fragmentary base (Fig. 101j), and one large, complete point

(Fig. 101k) appear to have strong associations with the Early Pithouse through Early Pueblo periods. Similar points were found in deposits from these periods in Tularosa, Cordova, and Reserve Area Caves, as well as at the SU site (Martin 1949; Martin et al. 1952, 1954). The smaller, fragmentary, leaf-shaped point base has been found in prepottery levels in the above cave locations, but in much lower frequencies than during the later periods.

The third point (expanding base narrower than shoulder; Fig. 101l), a complete base with one intact barb and a missing blade tip, is found from prepottery through Late Pueblo period levels in Tularosa and Cordova Caves, the majority occurring from the Late Pithouse through the Late Pueblo periods (Martin et al. 1954). The final point is a fragmentary blade (Fig. 101m).

Lithic artifacts were found in all six strip zones but concentrated in Features 4 and 5 from 2 to 10 m north. Numbers in strip zones to the east (Features 1-3) drop off gradually in frequency to a near absence of lithic artifacts in Feature 1. On the west side of the concentration, Feature 6 drops off sharply in lithic artifacts.

The concentrated area yields lithic artifacts almost exclusively from the surface and Level 1, whereas in the area immediately to the west, lithic artifacts are distributed through Levels 1 and 2, with either an absence or minimal numbers above and below those levels.

Projectile Points, Phases 2 and 3

Bat Cave/Lobo Point

This point is complete except for a missing tang. It is manufactured from mottled yellow-brown and red clastic chert, which does not appear to outcrop locally. The point is bifacially worked with bimarginal retouch present along one entire edge, over the haft element, and up to the broken tang. The other edge exhibits bimarginal retouch along the blade only, ending at the hafting element. The "notches" and the concave base are ground. Similar points are found throughout New Mexico and eastern Arizona under varying type names and associated dates. Among them are the Bat Cave point (Dick 1965:29, Figs. 23c, 23d), originating in a level from which 3981 B.C. $\pm$ 310 is the most reliable date, and a point from the Concho Complex, near Concha, Arizona, dated post 6000-2500 B.C. (Wendorf and Thomas 1951:110, Fig. 49d). Lobo points from the Lobo phase of the San Jose Complex near Grants also resemble the Gallo project point (Agogino and Hibben 1958:424, Fig. 2c).

Specimen: LA 6076 FS 29-109; LA 6076, Room 29 subfloor test (20 cm below floor); 3.7 by 1.6 (blade width) by 0.6 cm.

Large, Stemmed, Concave-Base Point

This complete point is of clear gray obsidian. It is bifacially and bimarginally worked the full length of the blade and stem. The base is thinned along the concave edge by the removal of three flakes from one face. No basal grinding is present. Blade edges are straight, and the stem is slightly contracting, narrower than the shoulders, with a concave base. The blade tip is blunted. Points of this type are nearly absent from published references, although the prepottery levels of O Block Cave yielded two similar examples (Martin et al. 1954: Fig. 63f, Type I). Points with similar general morphology are widespread in Mogollon sites but have narrow blades with longer stems.

Specimen: LA 5407 FS 39-17, Feature 39 (main chamber) floor fill; 4.6 by 2.7 (blade width) by 0.6; stem width 2.1 cm.

Kent-Like Point

This point is of brown silicified wood. It is bifacially worked with some marginal retouch along one blade edge. Blade edges are irregularly convex. The tang and barb may be missing from one side. This "broken" side of the base is fractured along the straight grain of the silicified wood and may have been left as such, since further flake removals from this edge may have been unsuccessful. The point is thinned by the removal of a flutelike flake from the base on one face. The base is convex, expanding, and narrower than the shoulders. No basal or notch grinding is present. The point resembles Kent points, particularly in the weak shoulders, crude manufacture, convex edges, and uneven barbs (Suhm and Krieger 1962:199, Plate 100). Similar points were most numerous in prepottery and Early Pithouse levels of O Block Cave in the Reserve area (Martin et al. 1954).

Specimen: LA 14906 FS 147-1: 5.9 by 1.6, strip zone Feature 5 surface. (blade width) by 0.5 cm; stem width 1.3 cm.

Leaf-Shaped Points

Two complete and two base fragments, a total of four, comprise the leaf-shaped point group. The bases of all four points are markedly convex. The two base fragments are of gray chalcedony, one of which is heat treated. Both base fragments are bifacially reduced with thin, plano-convex or biconvex cross sections. The two complete leaf points, one of clear gray obsidian, the other of clear/white chalcedony, exhibit thicker, biconvex cross sections with unifacial retouch. Blade edges are unretouched along a portion of one face on both points. All four points have an unfinished appearance, although leaf-shaped points are fairly common in Mogollon sites. Leaf-shaped points with thick cross sections are nearly equally distributed from prepottery through Late Pueblo period levels at Tularosa, Cordova, and O Block Caves Martin et al. 1952:163, Figs. 51i-51t, Type M-3; and Martin et al. 1954:122-123, Figs. 63r, 63s, Type M-3).

Thinner leaf-shaped points more closely resembling the base fragments are most common in the earlier levels, prepottery and Early Pithouse periods, at Y Canyon Cave (Martin et al. 1954:123, Figs. 63o, 63p, 63q, Type M-1). The SU site also yielded similar points, all of which were found in Early Pithouse period pit structures (Martin 1943:208, Fig. 73, type C). Thus, although leaf-shaped points seem to occupy a broad time span from preceramic through the Late Pithouse period, they are more frequently associated with preceramic and Early Pithouse periods than with later Mogollon periods.

Specimens: LA 5407 FS 25-44, Feature 25 (antechamber fill). Complete; clear gray obsidian; 2.2 by 1.0 by 0.3 cm.

LA 14909 FS 463-1, Feature 1, west exterior Area 3, Level 21. Complete; clear/white chalcedony; 2.6 by 1.9 by 0.6 cm.

LA 14920 FS 825-13, Feature 3 surface. Base fragment; gray chalcedony; 2.2 (incomplete) by 1.5 by 0.3 cm.

LA 14930 FS 637-14, strip zone Feature 5, 2-4 m north, 5-10 cm bs. Base fragment; heat treated gray chert; 2.5 (incomplete) by 1.6 by 0.5 cm.

Scallorn-Like Points

These points were grouped based on several characteristics: diagonal notches; straight, expanding bases narrower than shoulders; and long, thin, narrow, finely chipped blades with convex edges and biconvex cross sections. The group is entirely comprised of fragmentary points: two complete with one missing tang, one complete base, five with complete blades and partial bases, two medial fragments, and three blade tips, a total of 13 artifacts.

The points are primarily obsidian (n=8) with clear gray (n=2), clear gray banded (n=1), silvery gray (n=4), and dark smoky gray (n=1) color variations, one of which is partially fused. Two white chert (one burned), one gray chert, one red chert, and one Pedernal-like chalcedony comprise the remainder.

Although preceramic associations do occur with this point, it is far more solidly associated with late Mogollon sites. Both Tularosa and Cordova Caves yielded these points (Type B-4) almost exclusively in ceramic periods, with peak frequencies in the later periods (Martin et al. 1952:157, Figs. 45q-45t). They are also similar to Scallorn points, with a broad temporal range of A.D. 700-1500 (Bell 1960:84, Plate 42).

Specimens:

LA 5407 FS 39-326, Feature 39 (main chamber), southeast quad, floor fill. Complete with one tang missing; white chert, burned; 3.6 by 1.3 by 0.2 cm.

LA 5407 FS 39-434, Feature 39 (main chamber) southeast quad floor. Complete with one tang missing, red chert; 3.2 by 1.1 by 0.2 cm.

LA 5407 FS 39-269, Feature 39 (main chamber) southwest quad floor. Complete base, fragmentary blade; gray chert; 2.8 (incomplete) by 1.8 by 0.2 cm.

LA 5407 FS 39-324, Feature 39 (main chamber) northeast quad, fill. Fragmentary base, complete blade; smoky gray obsidian; 3.0 (incomplete) by 1.3 by 0.2 cm.

LA 5407 FS 39-325, Feature 39 (main chamber) southwest quad, storage pit fill. Fragmentary base, complete blade; clear banded gray obsidian; 3.4 (incomplete) by 1.4 by 0.3 cm.

LA 5407 FS 7-2, fill between Feature 39 (main chamber) and Feature 25 (antechamber). Fragmentary base, complete blade; dark gray obsidian; 3.1 (incomplete) by 1.1 by 0.2 cm.

LA 5407 FS 39-329, Feature 39 (main chamber) southwest quad, floor fill. Fragmentary base, complete base; Pedernal-like chalcedony; 3.3 (incomplete) by 1.1 by 0.2 cm.

LA 5407 39-369, Feature 39 (main chamber) northeast quad, under a metate. Medial fragment; smoky gray obsidian; 2.0 (incomplete) by 1.2 by 0.3 cm.

LA 5407 FS 39-270, Feature 39 (main chamber) fill. Medial fragment; fused, clear gray obsidian; 2.1 (incomplete) by 1.2 by 0.2 cm.

LA 5407 FS 39-337, Feature 39 (main chamber) northeast quad, floor fill. Medial fragment; clear gray obsidian; 1.6 (incomplete) by 1.3 by 0.2 cm.

LA 5407 FS 25-57, Feature 25 (antechamber) fill. Medial fragment; smoky gray obsidian; 1.4 (incomplete) by 0.9 (incomplete) by 0.3 cm.

LA 6076 FS 8-5, strip zone, Feature 8 fill. Medial fragment; clear gray obsidian; 1.7 (incomplete) by 0.7 (incomplete) by 0.3 cm.

LA 6076 FS 0-1, site surface. Medial fragment; white chert; 1.2 (incomplete) by 0.8 (incomplete) by 0.3 cm.

Expanding Base Narrower than Shoulder, Straight to Convex Base

This group of four points is comprised of two complete points, one of clear chalcedony, one of clear gray obsidian, and two base fragments, one of gray chert and one of red and white mottled chert (heat treated). The blade edges are straight to convex. All three are bifacially reduced, with marginal retouch completely absent. Basal/notch grinding is absent. Similar points were found at Wet Leggett Pueblo, an Early Pithouse period site (Martin and Rinaldo 1950b:483, Fig. 184a) and from prepottery through Late Pueblo levels at Tularosa and Cordova Caves, where the early levels yielded the highest frequencies (Martin et al. 1952:159, Figs. 41l-41t, Type G).

Specimens:

LA 6076 FS 8-4, strip zone Feature 8, 0-10 cm bs. Complete; clear chalcedony; 3.5 by 1.8 by 0.4 cm.

LA 6076 FS 12J-7, outside northwest corner of Feature 59 (Pit Structure 59), 30-45 cm bs. Blade tip missing; clear gray obsidian; 1.8 (incomplete) by 1.4 by 0.3 cm.

LA 14920 FS 0-2, site surface. Base fragment; red and white mottled chert; 1.8 (incomplete) by 1.7 by 0.3 cm.

LA 14930 FS 637-15, strip zone Feature 5, 8-10 m east, 0-5 cm bs. Base fragment with missing barb; gray chert; 2.0 (incomplete) by 1.9 (incomplete) by 0.3 cm.

Diagonally Notched with Contracting Base

The single complete point in this group of three is of black, heat-treated chert. One tang is missing, though no broken edge is present. The contracting base is complete, with an irregular convex contour. Blade edges are slightly convex. The second point in this group is broken at the base. It is of clear gray, banded obsidian. Both points have thick, plano-convex cross sections with unifacial and bimarginal retouch. The third point, black opaque obsidian, has two broken barbs and a broken basal corner. It is completely bifacial. Similar points were recovered from the upper midden levels of Ventana Cave (Haury 1950:281, Fig. 59g) and are classed simply as Hohokam in origin.

Specimens:

LA 5407 FS 30-12, Feature 30 (storage pit) fill. Broken base; clear gray banded obsidian; 2.1 (incomplete) by 1.2 by 0.4 cm.

LA 14908 FS 352-1, strip zone Feature 8, 4-6 m east, 0-5 cm bs. Fragmentary; heat-treated black chert; 1.7 (incomplete) by 1.1 (incomplete) by 0.2 cm.

LA 14908 FS 352-2, strip zone Feature 8, 4-6 m east, 0-5 cm bs. Complete; black chert; 1.6 by 1.0 by 0.3 cm.

Small, Side-Notched, Straight Base Points

These two small points exhibit side notches oriented slightly toward the base. The base is straight, and cross sections are plano-convex. One blade edge of the complete point is serrated. Blade edges are straight with long, tapering tips. Both serrated and unserrated points of this type were found in the late levels of Tularosa Cave and throughout all levels of Y Canyon Cave (Martin et al. 1954:125, Figs. 64k-64x, Type S).

Specimens:

LA 6075 FS 16-238, Feature 16 (pit structure), floor fill. Complete; clear gray obsidian with gray particle inclusions; 2.6 by 1.1 by 0.2 cm.

LA 14909 FS 443-1, Feature 15 (room), floor contact. Blade tip and basal corner missing; clear banded gray obsidian; 1.9 (incomplete) by 1.2 by 0.3 cm.

Large, Diagonally Notched, Expanding, Straight Base Narrower than Shoulder

This point is complete except for the extreme blade tip. It is of mottled tan and pink chert. There is a fairly marked longitudinal curve, with the ventral side of the flake forming one face, the platform of which is at the base. Marginal retouch only is present on this face of the point. The opposite surface has one steeply beveled edge. Type E-1 points from O Block Cave are found primarily in the prepottery and Early Pithouse period levels and resemble this point (Martin et al. 1954:120). Several examples of similar points were recovered from pit structures at the SU site (Martin 1940:65, Fig. 29c).

Specimen: LA 14906 FS 105-1, general surface; 3.2 (incomplete) by 1.8 by 0.4 cm.

Diagonally Notched, Parallel Sided, Straight Base Narrower than Shoulders

This black chert point is similar to the above point but is separated because of its unfinished appearance, particularly at the base. Though short and irregular, the base is not broken. Deeper notches would make the point similar to above example. An identical point from Turkey Foot Ridge is classed as Pithouse period (Martin et al. 1949:169, Fig. 62g). Like the Gallo project specimen, the base is short, irregular and unbroken.

Specimen: LA 6075 FS 0-4, general surface; 2.8 by 1.6 by 0.6 cm.

Large, Leaf Shaped Point

This point is of brown fossiliferous chert from an unknown source. It is thin and well made by bifacial chipping. The extreme blade tip is missing. The removal of two large flakes from one face at the base thin the point nearly halfway up the blade. Point type M-3 from the Wet Leggett site are similar except for their much greater thickness (0.8-1.0 cm; Martin et al. 1954:163, Figs. 51i-51t). Points from pit structures at the SU site are similar morphologically though point thickness is not given (Martin 1940:65, Fig. 29f).

Specimen: LA 14930 FS 616-1, strip zone Feature 2, 10-12 m north, surface; 4.0 (incomplete) by 2.5 by 0.4 cm.

Parallel Stemmed, Straight Base Narrower than Shoulder

This crudely manufactured point is of dark gray, banded obsidian. It exhibits marginal retouch only, and almost exclusively on one face, giving the point a largely unfinished appearance. No basal grinding is present. Similar points are found at Y Canyon Cave and Hinkle Park Cliff Dwelling in ceramic levels (Martin et al. 1954:120, Fig. 61u, Type D). O Block Cave also yielded similar points from levels representing a broad time span (prepottery through Early Pithouse period).

Specimen: LA 14906 FS 140-1, strip zone Feature 8, 18-20 m north in lithic artifact concentration south of Feature 38, level unknown; 2.5 by 1.6 by 0.4 cm.

Serrated, Stemmed, Convex Base Narrower than Shoulder

This small, thin point is of clear gray obsidian. It is made from a markedly longitudinal-curving flake. The ventral side of the flake exhibits marginal retouch along one blade edge and the base only. The reverse, or dorsal, surface exhibits marginal retouch along both blade edges and the base. The blade serrations are shallow and evenly spaced. The convex base is slightly expanding, narrower than the shoulders. Similar points (Type H-1, Example B) date from prepottery through late Mogollon periods in Tularosa and Cordova Caves (Martin et al. 1952:151, 162, Figs. 50a-50d).

Specimen: LA 5407 FS 39-336, Feature 39 (main chamber) northeast quad, floor fill; 2.3 by 1.26 by 0.2 cm.

Unclassified, Unfinished Points (n=6)

Specimens:

LA 5407 FS 25-234, Feature 25 (antechamber) northeast quad, floor fill. Complete; clear gray obsidian. Ventral surface of flake covers one entire point face. Marginal retouch only on opposite face. Very narrow blade, with irregular edges; 2.4 by 0.7 by 0.3 cm.

LA 6076 FS 0-2, surface, hillside west of site. Tan, heat-treated chalcedony; triangular preform with one side notch and one base edge chipped into expanding base narrower than shoulder. Blade tip broken due to material impurities; 2.6 by 1.8 (base width) by 0.5 cm.

LA 6076 FS 5-8, Feature 5 (check dam), Level 2. Black Apache Creek chert; leaf shaped, edges very irregular, thick, irregular cross-sectional bifacial reduction. Blade tip missing; 2.9 (incomplete) by 2.0 by 0.8 cm.

LA 14858 FS 9B-7, Feature 9B (room) ash pit fill. Clear gray banded obsidian; crude, leaf shaped "point" with bifacial and bimarginal reduction. Small notch chipped into one blade edge; 3.3 by 2.5 by 0.5 cm.

LA 14909 FS 415-2, west exterior area, Feature 4, Level 26. Black Apache Creek chert; bimarginal retouch along one edge of flake fragment. Unretouched, clean broken blade edge measures 80 degrees; 3.2 by 1.3 by 0.3 cm.

LA 14917 FS 582-3, strip zone Feature 3, 2-4 m east, 0-5 cm bs. Basalt flake, unifacially reduced with a broken lobe and small chip out of one blade edge near the tip. Roughly leaf shaped with concave base. Irregular blade edges; 3.6 by 2.6 (incomplete) by 0.5 cm.

Fragmentary Points (n=4)

Specimens:

LA 5407 FS 39-265, Feature 39 (main chamber) northeast quad, floor fill. White chert; heat overexposed. Medial blade or drill fragment. Bifacial; 2.3 (incomplete) by 1.1 (incomplete?) by 0.6 cm.

LA 6076 FS 0-53, site surface. Black Apache Creek chert; bifacial blade tip; 2.4 (incomplete) by 1.4 (incomplete) by 0.4 cm.

LA 14909 FS 403-1, West Exterior Area 2, Feature 4, Level 26. Black opaque obsidian blade fragment with one diagonal notch. Bifacial; 3.3 (incomplete) by 1.6 by 0.4 cm.

LA 14930 FS 664-6, strip zone Feature 7, 4-6 m north, 10-20 cm bs. Black Apache Creek chert; bifacial blade tip; 2.1 (incomplete) by 1.3 (incomplete) by 0.3 cm.

FAUNAL REMAINS

Bone was collected from nine of the Gallo sites (Table 170). Sample sizes range from a low of 4 to a high of 1,013 specimens.

Little screening was done in trash deposits or in the fill of structures at the Gallo sites. Floors, use surfaces, and pit fill were usually screened. These particular collection practices tend to increase the proportion of rodent and large-mammal remains in the assemblage. Postoccupational rodent bones are often found near floors, and screening of floor and pit materials increase their numbers (Akins 1985:343; Akins 1987b:462). Larger bones are more readily spotted and collected in nonscreening situations.

Studies of refuse disposal in the Maya Highlands conclude that households treat refuse differently according to the size and type of refuse. Hard objects, such as bone, are removed from the living area (Hayden and Cannon 1983:157). Items retained within the household are often those curated for further use. They are small or located in areas that are difficult to reach and clean (Hayden and Cannon 1983:126-131).

If the Gallo inhabitants followed a similar strategy in refuse disposal, sampling at these sites would definitely affect the assemblage composition. Materials recovered near floors are likely to be bones curated for further use as tools, postoccupational intrusives, and small pieces missed in cleaning, rather than an accurate record of subsistence.

Methodology

Bone was analyzed by site and provenience using my personal comparative collection supplemented by the collections of the Museum of Southwestern Biology at the University of New Mexico. Each bone (specimen) was identified as precisely as possible with the exception of the rodent bones from the flotation samples, in which elements that are readily identifiable to the genera level (maxilla, mandibles, and some long bones) and taxa that have distinctive elements (e.g., pocket gopher and kangaroo rat) were specified. Other parts were identified by the size of the rodent. The additional effort necessary to completely identify all of the rodent parts was not feasible, considering that these are largely postoccupational and canid scatological remains. The variables recorded include taxon, element (body part), side, fragmentation, age, burning, weathering/etching, rounding, animal activity, and use or modification.

Site tables were hand tabulated. The regular sample was kept separate from the flotation sample. MNI (minimum number of individuals) calculations include only the regular sample. The MNI treats the entire regular sample from a site as one unit. Taking the age of individual into consideration, the MNI is the number of the most numerous element (unique body part) for that taxon. The maximum number of individuals is additive, usually treating each provenience division as a separate unit. Thus, if five proveniences at a site each had one rabbit represented, the maximum number of individuals would be five, even though there may be no duplication of body parts.

Age was recorded for each specimen. When the element was from an individual that is less than full grown, *immature* is used to designate animals that are less than two-thirds adult size, and *young adult* for those that are larger than immature up to adult size but with unfused epiphyses or those that display the porosity characteristic of less than mature bone. Burning was recorded as complete or partial, and by color if complete. *Weathering* encompasses two different conditions. Checking or cracking results from exposure. Etching presumably results from root activity in shallow deposits. In addition, rodent gnawing, carnivore gnawing, and carnivore tooth punctures were noted. Related to the carnivore alteration is the rounding of the edges of bones from digestive processes.

Taxa

Table 170 summarizes the taxa recovered by site and specifies whether the bone was from a regular sample, flotation samples, or both. Rabbits, artiodactyls, and pocket gopher are the most consistently found taxa. A relatively small number of carnivores, birds, and snakes are represented.

Rabbits

Cottontail *(Sylvilagus)* bones were found at six of the nine sites and outnumber jackrabbit remains at three of these. Both *S. auduboni* (desert cottontail) and *S. floridanus* (eastern cottontail) are found in Catron County. The latter is a more woodland species and is slightly larger than the desert cottontail (Findley et. al. 1975:83). The *Sylvilagus* from the Gallo sites could be either or both species. Heller (1976:14) reports both species were present in assemblages from Tularosa Cave.

Jackrabbit *(Lepus)* bones were found in more of the sites (eight) than any other taxon. Two sizes of jackrabbit are represented in the assemblages. Most of the elements are consistent in size with *L. californicus* (black-tailed jackrabbit); however, a few elements are considerably larger. The largest of the jackrabbits found in New Mexico, *L. townsendii* (white-tailed jackrabbit) is currently found only in the north central Rocky Mountains around Taos (Bailey 1971:47; Findley et al. 1975:92). Another possibility is *L. americanus* (snowshoe hare), since the specimens noted as large are limited to elements from rear feet. This species currently inhabits the northern Rocky Mountains (Bailey 1971:95; Findley et al. 1975:91).

The larger specimens are from LA 5407 (FS 25-177, FS 25-184, FS 39-649) and represent at least two rabbits. These are about 20 percent larger than a good-sized *L. californicus,* and it is unlikely that they represent this species.

Small Squirrels

A number of small squirrels inhabit Catron County. Among these are *Eutamias dorsalis* (cliff chipmunk), *E. cinereicollis* (gray-collared chipmunk), *Spermophilus tricemlineatus* (thirteen-lined ground squirrel), *S. spilosoma* (spotted ground squirrel), and *S. lateralis* (golden-mantled ground squirrel) (Findley et al. 1975).

Four sites have small squirrel remains, a total of five specimens. There is no indication that these were exploited as food items.

Large Squirrels

One species of squirrel, *Spermophilus variegatus* (rock squirrel), and Gunnison's prairie dog (*Cynomys gunnisoni*) were identified. The rock squirrel element is a mandible, and prairie dog is represented by a number of elements, including crania and a partial skeleton. Those specimens identified as large squirrel could be either squirrel or prairie dog; however, the majority are consistent with prairie dog anatomy.

A number of other species of large squirrel inhabit the area. These include *Cynomys ludovicianus* (black-tailed prairie dog), *Sciurus aberti* (Abert's or tassel-eared squirrel), *S. arizonensis* (Arizona gray squirrel, limited to the San Francisco drainage), and *Tamiasciurus hudsonicus* (red squirrel) (Findley et al. 1975).

Burned large squirrel bones were found at LA 6075, LA 6076, and LA 14858, suggesting some use of squirrels for food. None of the specimens identified as prairie dog are burned.

Rodents

Botta's pocket gopher (*Thomomys bottae*) is the most common of the small rodents found in the Gallo sites. It was recovered at seven of the sites. According to Bailey (1971:232), pocket gophers spend almost their entire lives under ground and are abundant in open yellow pine forests, where there are grassy parks, and in fertile valleys. None of the specimens recovered from the Gallo sites are burned, indicating that most, or all, were postoccupational occupants of the site area.

Perognathus bones were identified in the flotation samples from two sites. None are burned, and these are probably postoccupational intrusives. Findley et al. (1975:160) identify only one species of *Perognathus* as inhabiting the Gallo area, *P. flavus* (silky pocket mouse).

Dipodomys ordii (Ord's kangaroo rat) and the much larger *D. spectabilis* (banner-tailed kangaroo rat) are found in the Gallo assemblages. These are infrequent, and only LA 5407 has both species. Findley et al. (1975:175, 181) show that both inhabit the Gallo area. None of the specimens from these burrowing rodents are burned, and they are probably postoccupational intrusives.

The family Cricetidae includes a number of species that could be represented in the Gallo assemblages: *Reithrodontomys* (harvest mice), *Peromyscus maniculatus* (deer mouse), *P. truei* (piñon mouse), and *P. difficulis* (rock mouse). Cricetidae and *Peromyscus* sp. were identified at the same three sites, suggesting the majority are *Peromyscus*.

Woodrat (*Neotoma* sp.) is relatively common, occurring in five of the Gallo assemblages. Burned woodrat remains were found at LA 5407 and LA 6075, suggesting some utilization as food. Two species of woodrat occur in the Gallo area. *N. albigula* (white-throated woodrat) is found from the desert to mixed conifer habitats, and *N. stephensi* (Stephens' woodrat) inhabits rock accumulations in the piñon-juniper zone (Findley et al. 1975:241, 246).

Three species of vole (*Microtus* sp.) are reported for Catron County, but none specifically for Largo Creek. *M. pennsylvanicus* (meadow vole) inhabits grass-sedge communities near permanent water (Findley et al. 1975:255), *M. mexicanus* (Mexican vole) prefers grasslands in ponderosa and mixed conifer forests (Findley et al. 1975:257), and *M. longicaudus* (long-tailed vole) lives in meadows at the edge of mixed conifer and spruce-fir forests.

The Gallo voles were identified from mandible and maxillary parts. Voles were found at three sites, one in a flotation sample. None of the specimens are burned.

Unidentified rodents. *Small rodent* was used to classify unidentifiable, fragmentary, and postcranial remains of rodents the size of *Perognathus, Peromyscus, Microtus, D. ordii*, and *T. bottae*. Burned small rodent bones were found at LA 6075 and LA 6076. While these may have been burned accidentally, it is also possible that some are food remains.

The small-to-medium rodent taxon includes rodents up to woodrat in size, and the medium-to-large includes woodrats, the larger kangaroo rat, small squirrels, and any other larger-sized rodent. Burned bones from medium-to-large and large rodents were found at LA 5407, LA 6075, and LA 6076.

Carnivores

Relatively few carnivore bones were found at the Gallo sites. Few were taken and utilized, or the remains were discarded outside of the site area. Coyotes (*Canis latrans*) are found throughout New Mexico in all habitats (Findley et al. 1975:281), yet only one site had this species. Wolf (*Canis lupus*) probably occurred in the Gallo area but was not found in this collection, nor were any of the foxes. The only dog (*Canis familiaris*) was a burial at LA 5407. Rounded and gnawed bone at other sites suggest a greater presence.

Black bears (*Ursus americanus*) inhabit the area but was not identified in the collection. Badger (*Taxidea taxus*) was found in only one assemblage, LA 6076, yet it is relatively common throughout the state, especially in the vicinity of burrowing rodents (Findley et al. 1975:308).

Bobcat (*Felis rufus*) was found at LA 5407. Parts include a carnivore-gnawed mandible and a number of claws. Bobcats are found throughout the state in almost all habitats (Findley et al. 1975:320). More unusual was a carnivore-gnawed scapula blade fragment from a large felid found at LA 6076. This could be a mountain lion (*Felis concolor*) or a jaguar (*Felis onca*). Jaguars are about the same size as mountain lions and once occurred as far north as Santa Fe (Findley et al. 1975:317).

The Gallo carnivore bones are often completely burned. Bobcat and small-carnivore specimens from LA 5407 are burned, and canid, coyote, and badger specimens from LA 6076 are burned.

Artiodactyls

Few artiodactyl bones could be identified to the species level or even as artiodactyls. Given the surrounding environment, more artiodactyl bone was expected. A number of factors may contribute to the paucity, including processing of animals where they were taken rather than at the site, selective deposition of larger bones, or site collection procedures. Since trash deposits were neither selected nor screened, smaller artiodactyl remains may have been missed.

Table 171 gives the breakdown of body parts for each site and taxon. Most body parts are represented; however, the overall number of specimens is too small to address transport or processing. Burning is fairly common at LA 5407, due in part to the burned structure, but rare or absent at the other sites. No immature artiodactyls specimens were found.

Elk *(Cervus elaphus)* was not identified in the collection. Some of the antler (recorded as Cervidae) is large enough that it could be either elk or deer. Similarly, the large artiodactyl or very large mammal taxa could include elk remains. Elk was found in or near the Gallo area as late as 1965 (Findley et al. 1975:327), well within the hunting range of the site inhabitants.

Mule deer *(Odocoileus hemionus)* range throughout the state at all elevations and in all habitats browsing on brush and conifers. White-tailed deer (*O. virginianus*) were present in the Gallo area in 1965. This species inhabits brushy country in the southwestern mountains of New Mexico and may occur as high as 3,048 m in elevation. Where they co-occur with mule deer, white-tailed deer tend to favor more rugged terrain (Findley et al. 1975:328-332).

One or both species of deer were found in the assemblages from most of the sites. Elements from both were used to make tools (Table 172). At LA 6076, mule deer bone was found only as tools.

Pronghorn *(Antilocapra americana)* was found at two sites and occurs in almost equal numbers with mule deer at LA 5407. Pronghorn is the only artiodactyl identified in the LA 6075 assemblage. Pronghorn inhabit open grasslands below the woodlands. The 1965 distribution includes the Plains of San Agustín to the southeast, an area to the north around Quemado, and areas to the south and west (Findley et al. 1975:333).

Only LA 5407 has identifiable bison *(Bison bison)* remains. However, large artiodactyl and very large mammal were found at LA 14858, LA 14906, and LA 14907 and could be bison. Although some biologists report the range for bison as limited to the eastern plains (e.g., Bailey 1971; Findley et. al. 1975), archeological collections indicate a greater prehistoric range (e.g., Akins 1987a). Reynolds et al. (1982:972) suggest a range which includes about 80 percent of New Mexico and both the plains bison (*Bison bison bison*) and wood bison (*Bison bison athabascae*).

Bison has been found in assemblages from Tularosa Cave (Heller 1976:41), Bat Cave, Mogollon Village, Pine Lawn, Swartz Ruin (Dick 1965:92), and Mariana Mesa (McGimsey 1980:972) suggesting a larger prehistoric range. Long bones, vertebra, and rib fragments from a very large mammal or large artiodactyl were recovered from the Gallo sites, mainly from LA 5407.

A horn sheath of domestic cow *(Bos taurus)* was found on the surface at LA 6076. It is the only incidence of this species in the assemblages.

A nearly complete second phalanx from a mountain sheep (cf. *Ovis canadensis*) was found at LA 14858. Mountain sheep occupy a small area north and east of the Gallo sites extending into Valencia County and small areas along the southern boarder of Catron County (Findley et. al. 1975:336). Heller (1976:14) reports mountain sheep in assemblages from three time periods at Tularosa Cave. The sparse distribution in the Gallo assemblages suggests this species was relatively rare in the area or that it was not regularly exploited.

A domestic sheep or goat bone *(Ovis/Capra)* was found at LA 6076. It is from the upper 5 cm of fill in the check dam area.

Wild Birds

Few bird bones were recovered. Those that could be identified include a phalanx from a hawk (*Buteo* sp.) from LA 14908, a raven (*Corvus corax*) bone from LA 5407, and one from a scaled quail (*Callipepla squamata*) from LA 6076. Unidentified small bird was found at LA 5407, LA 6075, and LA 6076, medium bird (size of quail) at LA 5407 and LA 6076, and large bird (size of hawk or turkey) at LA 5407 and LA 6076.

Burned specimens of small bird were recovered from LA 5407 and LA 6076 and of large bird at LA 6076. Three large elements from LA 5407 exhibit carnivore-gnawing, and a medium bird element is rounded. These suggest that birds entered the archaeological record in a variety of ways. Some may have been economic, used for food or feathers; others may have been caught and eaten by dogs.

Wild turkeys *(Meleagris gallopavo)* inhabit mountain and canyon areas. One of the main populations today is in the Mogollon Highlands south of the Gallo area (Hubbard 1978:20). Turkey bones were found at three of the Gallo sites: LA 5407 (n=1), LA 6076 (n=3), and LA 14909 (n=2). Only LA 6076 had egg shell (31 pieces), and one of the three elements from that site is burned. The excavators of LA 14909 noted pockets of yellow soil in one room and thought it might be turkey dung. Both of the turkey bones from that site were found in that room. Overall, the evidence for keeping domestic turkeys is paltry. The bones from LA 5407 and possibly LA 14909 are probably wild turkeys.

Turkey has been reported from Tularosa Cave, dating back to the prepottery phase (Heller 1976:35). Evidence for domestication--corn and beans in the stomach of a desiccated bird--at Tularosa Caves dates back to A.D. 1100 or earlier (Heller 1976:35; Schorger 1966:22).

Reptiles and Amphibians

Bones from reptiles and amphibians were rare. These consist of one from a toad, possibly *Bufo woodhousei* (Woodhouse's toad); a rounded portion of a cranium from a horned lizard (*Phrynosoma* cf. *douglassi*); and a few identified only as snake. There is no indication of human utilization of these taxa.

Unidentified

Small mammal includes pieces of bone from animals the size of jackrabbit or smaller. *Medium mammal* are animals from the size of jackrabbit to coyote or dog. *Large mammal* are animals the size of coyote or larger. The unknowns could be mammal, bird, or snake. Small unknowns are medium rodent or smaller and may include small birds and snakes.

Unknown categories often comprise a sizable portion of a faunal assemblage. This was true of LA 5407, LA 6076, and LA 14906. It was not true of LA 6075 (10.1 percent), LA 14858 (14.4 percent), or LA 14909 (19.9 percent), suggesting especially poor collection of bone at those sites.

Discussion

Because the Gallo sample is heavily biased toward floor materials, with fill and trash deposits collected as individual labors saw fit, the assemblages are difficult to compare with those from other sites. Linsky (1975) summarized Mogollon faunal assemblages from 29 reports dating from 1938 to 1956 and concludes that the variety of animals exploited decreased with time. She notes that, based on counts, Cochise assemblages include a broader spectrum of species comprised of an average of 52 percent deer, 11 percent pronghorn, and 18 percent mountain sheep. Later assemblages consisted of 60 percent to 80 percent deer and/or pronghorn and 4 to 10 percent rabbit. The sites used by Linsky may reflect a sampling strategy that selected for larger bones. The greater variety may simply result from the predominance of early sites that were located in caves in her sample.

Table 173 suggests the opposite result for the Gallo sites. Rabbit bones consistently outnumber artiodactyls. The percent of rabbit in the assemblages actually increases from the early site (LA 5407) to the later ones. Identified artiodactyl bones are low in percentages at LA 5407, but this may reflect the collection procedures. When few unidentifiable bones are collected, as at the other sites, the identified taxa comprise more of the assemblage. Furthermore, the sample size of LA 5407 is much larger than that of the other sites, which may account for some of the difference.

In the Southwest, increased community size, residential stability, and horticultural commitment tend to be associated with greater utilization of large mammals. Reliance on horticulture increases the need for high-quality protein, which is most efficiently acquired from larger-sized mammals (Speth and Scott 1985:244-245, 248, 257). It is tempting to suggest that the Gallo faunal assemblage indicates that a greater reliance on horticulture and less residential mobility were associated with the *earlier* occupation of Largo Creek. However, given the myriad problems associated with collection procedures and our lack of information on prehistoric settlement of the area, this conclusion is not yet possible.

FLOTATION AND MACROBOTANICAL MATERIALS

Mollie S. Toll and Pamela J. McBride

Botanical materials from seven sites of the Gallo project include a wildly uneven array of assemblages. Most of these sites, including a shallow brush structure from the Early Pithouse period (LA 14906), pit structures with additional rooms of the Early Pueblo period (LA 6075, LA 6076, LA 14858), and two- to four-room structures of the Early Pueblo period (LA 14907, LA 14909) suffer from the sorry state of preservation of perishables seen at many sites sharing the heavy clay soils of the Quemado-Reserve area. LA 5407, on the other hand, is a site with remarkable interpretive riches. This large, shallow pit structure, nearly 9 m across, burned while still in daily use around A.D. 520. More than a dozen ceramic, squash, and basketry vessels retained their original pantry contents for our twentieth-century inspection. The contents of any one of these vessels includes more floral specimens than are usually recovered from an entire site, or *many* sites, in the area. More important than the sheer quantity of remains at LA 5407, however, is our ability to link specific plant remains with their context of use, and this aspect derives from the drop-everything-and-leave abandonment mode. The flip side of our fine fortune in dealing with a substantial and diverse floral assemblage at LA 5407 are the inevitable difficulties in piecing together artifact locations and contexts from excavations that took place nearly twenty years ago. Materials that were very clearly linked to one another were sometimes recorded by different systems, muddling the process of recreating those links.

At elevations in the range of 2,200 m, the vegetal resource base of Gallo sites benefits from an average annual precipitation of 40.6 cm (16 in). Gallo sites are on terraces and ridges above Largo Creek, an intermittent stream fed by springs (Table 174). The Gallo area is in the upper elevational range of Great Basin conifer woodland (Brown 1994:55), intergrading with montane conifer forest. This area contains ample quantities of piñon and juniper, providing fuel and construction materials, and valuable periodic piñon nut crops. Ponderosa pine and shrub and tree species such as oak, walnut, squawberry, and mountain mahogany are most common in canyon locations. A freeze-free period of 150 days and a mean annual temperature of 9 degrees C limits both dependability and productivity of agricultural endeavors (USDA Forest Service 1986). Crops such as beans, gourds, and cotton are close to the limit of where they can be grown. Thin, rocky soils on this ash flow of the Datil formation limit long-term agricultural productivity.

The Gallo project, and in particular the provocative LA 5407 assemblage, is well suited to address some persistent questions about the role of early agriculture in the Mogollon highlands and more broadly in the Southwest. With some of the Southwest's earliest examples of corn coming from nearby dry shelters at Bat, Tularosa, and Cordova Caves (Cutler 1952; Dick 1965; Kaplan 1963), questions of how and why agriculture entered the economic lives of these mountain residents have been debated for decades (Diehl 1996; Martin 1943; Martin and Rinaldo 1947; Mauldin 1991, 1993; Wills 1988). The botanical assemblage from LA 5407 provides some detailed, direct subsistence evidence from a different site type, in a post-Archaic context.

Methods

The soil samples collected during excavation were processed at the Laboratory of Anthropology in 1977. The flotation method used is undocumented, and we can only guess about the technique used on this project nearly two decades ago. Our presumption is that a version of the simplified "bucket" method of flotation was used (see Bohrer and Adams 1977). In this technique, each sample is immersed in a bucket or barrel of water, and a 30-40 second interval allowed for settling out of heavy particles. The solution is then scooped with or poured through a fine screen (about 0.35 mm mesh) that may be lined with a square of "chiffon" fabric, catching organic materials floating or in suspension. The contents of the screen are banged out onto a sheet of newsprint, or the fabric is lifted out and laid flat on coarse mesh screen trays, until the recovered material has dried. Many of the processed Gallo flotation samples contained a substantial silt component, leaving us with yet more confusion about exactly what flotation method was used.

In many cases, multiple flotation samples from a single provenience (and bearing the same FS number) are present. It is possible that each bag represented flotation from a standard volume of original soil sample, such as one liter. One bag was picked for analysis from each provenience selected for flotation sampling. Samples remain in storage from many of the proveniences discussed here, as well as from additional proveniences. Each sample was sorted with a series of nested geological screens (4.0, 2.0, 1.0, 0.5 mm mesh) and reviewed under a binocular microscope at 7-45x. A total of 18 samples from five sites (LA 5407, LA 14858, LA 14906, LA 14907, and LA 14909) were "full-sorted" (Table 174), providing counts (or estimated numbers) of all seeds present in all screen sizes. Because many of these samples are very large, it was necessary to subsample some screen sizes in some of the samples and calculate an estimated number of seeds for the total sample.

A large number of flotation samples were available and of interest from the Gallo project, but the budget was unable to cover full-sorting of every sample. Scanning, which provides a reliable record of presence and absence of seed taxa in flotation samples, was adopted as a cost-efficient method of systematically reviewing archaeobotanical contents of a substantially larger number of samples. In all, 46 samples were scanned, including all samples from LA 6075 (n=13) and LA 6076 (n=21). In this procedure, all materials caught in the larger screens (4.0, 2.0, and usually 1.0 mm mesh) were examined completely, and a sample of materials from the 0.5 mm screen was inspected. Material passing through all screens (usually containing very few fragments of seed taxa occurring in the larger screens) was not examined at all. Examples of each taxon encountered were removed and placed in polypropylene capsules. However, no effort was made to retain every seed and fragment present, and seeds were not counted.

From each full-sort flotation sample with sufficient charcoal (n=18), a sample of 20 pieces of charcoal was identified (10 from the 4 mm screen, and 10 from the 2 mm screen). Each piece was snapped to expose a fresh transverse section, and identified at 45x. Low-power, incident-light identification of wood specimens does not often allow species- or even genus-level precision but can provide reliable information in distinguishing broad patterns of utilization of a major resource class.

Macrobotanical remains were examined, identified, and measured where appropriate (Table 174). Items which could not be linked with cultural contexts (for instance, those from strip trenches) were omitted from analysis. Specimens were weighed on a digital, top-loading balance with 0.01 g accuracy. Corn specimens (all carbonized) were measured using dial calipers, following parameters detailed in Bird (1994) and Toll and Huckell (1996). To be considered measurable, cob fragments needed to possess a full circumference, and kernels needed to be complete in two of the three possible dimensions (length, width, and thickness). Unburned cucurbit seeds and carbonized beans were measured as to length, width, and thickness with dial calipers to the nearest 0.1 mm. Other specimens were identified by taxon and part by comparison with modern reference specimens. When necessary, fragile specimens were wrapped in acid-free tissue and/or polyester fiber and placed in durable containers to protect them from further breakage.

Corn kernels and seeds recovered in vessels at LA 5407 were often fused, presenting a quantitative challenge. Experimental burning of modern plant materials under various heating conditions allowed us to reconstruct some parameters of original number, volume, and condition of the vessel contents. From previous experimental work by Lentz et al. (1996), we know that puffed, white-opaque obsidian in Quemado Alegre's burn deposits indicate the temperature reached at least 850 degrees C. Small pots filled with weedy annual seeds were placed in Eric Blinman's experimental pottery firings. Temperatures were monitored by a cast-off thermocouple apparatus from Los Alamos National Laboratory. When temperatures reached the 850 degree C temperature range, dirt was shoveled on the fire, duplicating the failure of support beams and collapse of roof onto the floor. From multiple replications we were able to determine that during this kind of low-oxygen carbonization, seed *volume* stays relatively constant, and various taxa of seeds lose a remarkably uniform 80 percent of their dry weight. We repeatedly duplicated the fused masses of seeds observed at Quemado Alegre and other sites, though we really don't know how or why that happens. We were baffled by the problem of *counting* seeds, or corn kernels, in fused masses, but could produce estimated totals by working backwards from counts and weights of loose seeds before and after burn experiments. We concluded that weights were the most useful standard measure of quantity. Weights are easily and reliably obtained and can be used to produce reasonable counts and weights of the original food material.

Michael Diehl identified multiple lots of macrobotanical materials from LA 5407 in the course of research for his dissertation (summarized in Diehl 1996). These include all of the wood specimens detailed in a later section of this report. Inventories of plant taxa present in additional macrobotanical specimen lots contribute to our understanding of the distribution of specific economic taxa in Feature 39.

Results by Provenience

Early Pithouse Period

LA 5407. LA 5407 has been only partially excavated to date. It includes a burned pit structure (Feature 39) and its antechamber (Feature 25). The pit structure roof collapsed and allowed the preservation of abundant and diverse floral remains in recognizable form alongside the archeological features, tools, and containers used to process and store these usually unrecovered, perishable plant parts. Although ceramic and lithic artifacts point squarely to a Pinelawn or Early Pithouse occupation (theoretically, sites situated on high, isolated knolls, oriented towards labor-intensive horticulture), LA 5407 is close to prime agricultural lands (on a terrace 100 m from arable valley bottom). The preservation of significant quantities of agricultural products (corn, beans, and cucurbits) suggests heavy reliance on stored domestic crops (more characteristic of the Late Pueblo period). Does this apparent profusion signify a subsistence emphasis, or it is a result of unusual preservation? It is worth noting that LA 5407's record of weedy annual food plants is *also* more abundant and diverse than at other Gallo sites.

The present investigations of LA 5407, stemming from 1977 Laboratory of Anthropology excavations, concentrate on a single pit structure and its antechamber (Features 39 and 25), and associated extramural features (Features 26, 27, 29, 30, and 32). From the 1972 survey and earlier excavations by the Laboratory of Anthropology (Castle Rock project), we know that at least three additional pit structures and associated features were part of this Early Pithouse village. Contents of Castle Rock Feature 12, a well-preserved pit structure nearly 6 by 8 m, included charred beans, corn, and gourd; and Castle Rock Feature 23, an extramural storage pit, was filled with nearly 7 cu m of carbonized corn kernels (Kayser 1973:16; estimated corn volume is based on pit dimensions and the description of pit fill as mostly kernels with very little soil). All of these materials remain unanalyzed in Laboratory of Anthropology storage.

Some problems were encountered in determining actual and relative locations of floral materials in the Feature 39 pit structure. Upper fill and roof-fall at LA 5407, for instance, were removed by grid, while locations on the pit structure floor were recorded by degree and distance from the structure's center. Botanical materials listed as "vessel contents" might be located by grid, while the actual vessel wasn't numbered or recorded until later, when it received a different kind of address. Recognizing the importance of tying specific plant resources to their context of use, we invested a considerable amount of time evaluating provenience notations of whole vessels, fragmentary vessels often listed under multiple specimen numbers, "vessel contents," and macrobotanical remains on the floor.

The general fill of the pit structure was removed as a unit, and only the last 15 cm above the floor was screened. Burned roofing materials were encountered 15-20 cm above a hard-packed, heavily burned floor. Roof materials were found inside many of the ceramic vessels standing directly on the pit structure floor (Fig. 102). Six metates and several baskets were recovered on top of the roof beams. In the absence of roof construction flat enough or strong enough to support a work area, a storage area is inferred.

Flotation sampling at LA 5407 reveals some interesting details of the horizontal distribution of plant materials, particularly those consisting of small individual specimens. Accessions designated as "botanical remains" tended to be large or familiar enough to be recognized with the naked eye (corn, piñon, and walnuts, fused masses of tiny seeds, squash seeds), especially when associated with some artifact or feature (vessel contents, "under and around metate," "near hearth"). Flotation samples from the hearth and several floor locations, including the antechamber (Table 175), reveal the outward movement of material from primary food-manipulation contexts and the repetition of materials found in the hearth and scattered on the floor (Pearsall 1988:112, 115). LA 5407 floral remains contrast with most open sites in that catastrophic burning has preserved materials which did not ultimately derive exclusively from prehistoric heating and warming features. We were able to learn about the horizontal and vertical distribution of botanical materials without relying solely on materials intentionally or accidentally deposited in thermal features.

A flotation sample from pit structure fill (Table 176) reveals a vertical mixture of floor materials common on the floor in the east half of the structure (corn kernels, squash exocarp) and reedgrass from the roof. Without the preservation advantage of catastrophic burning, flotation from extramural storage pits contributes meager information on their function (Features 30 and 32; Table 176). Two piñon nuts encountered during excavation of Feature 27 and a partial yucca fruit with seeds in Feature 32 reveal use of some important wild plant food products associated with extramural features.

Flotation samples from six ceramic vessels and three baskets provide an overview of vegetal

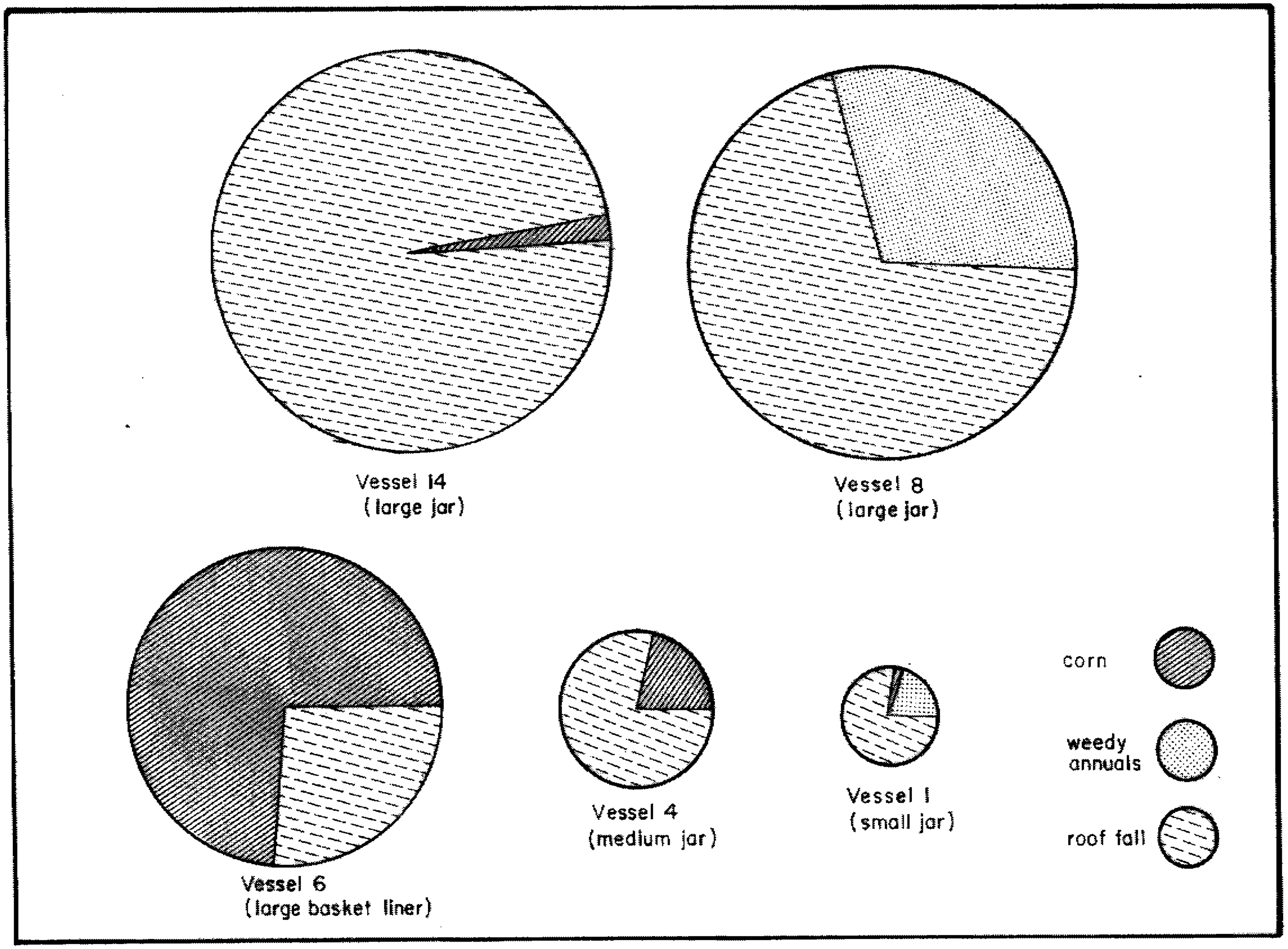

Figure 102. Vessel contents by weight, LA 5407.

contents of these containers (Tables 177-180). Small numbers of corn kernels were noted in every vessel, and cob fragments in many. We suspect that these flotation samples represent the soil residue after screening through a fairly coarse screen, perhaps one-quarter-inch mesh. For instance, from Vessel 7 (a large globular jar in the southeast quad) we have 41 measurable beans plus numerous fragments curated separately as FS 39-795, but only a small number of bean fragments in flotation. The contents of Vessels 1, 4, 8, and 14 (all jars) and Vessel 6 (a large clay basketliner) appear to have been collected as total entities. These were screened and sorted in the OAS lab to determine the total composition of vessel contents (Fig. 102). Wood and reedgrass plus the dirt and charcoal dust passing through the 0.5 mm screen were classified as roof material, which comprised from 1 percent (Vessel 6) to 92 percent (Vessel 14) of contents. Corn kernels were a significant component in Vessels 4 and 6, and 4.4 g were present in the bottom of Vessel 14, a large jar apparently fairly empty at the time of the fire. Large quantities of sunflower and winged pigweed seeds testify to the storage functions of Vessels 1 and 8, respectively, at the moment the structure burned. Contents of additional vessels were determined by examining samples which appeared to represent partial contents of vessels and baskets.

The linked occurrence of many vessels of various materials, sizes, and forms, with their contents, provides an excellent opportunity to consider the typology of vessel *use*. Ceramic jars and bowls of various sizes, as well as baskets and a cucurbit vessel, were found on the pit structure floor. The cucurbit vessel consists of a hollowed-out, hard-shelled squash that apparently exploded during the fire. Hundreds of shell fragments were concentrated in close proximity, and goosefoot and amaranth seeds adhered to the inner surface of several of these sherds.

We might expect that large seeds like corn kernels would be stored in large vessels and small seeds in small vessels. This was not true in all cases at LA 5407. Corn kernels were recovered from all sizes of both bowl-shaped and jar-shaped vessels. Perhaps multiple uses are represented here, such as corn saved for seed as well as various food and ceremonial applications. A large jar contained the only stash of beans. Small seeds such as goosefoot, amaranth, sunflower, and winged pigweed were found in both large and small ceramic jars as well as in the cucurbit vessel and a basket.

One large vessel contained approximately 265,000 winged pigweed seeds weighing 159 g. Dietary information available for a closely related seed type suggests that this is not a large quantity of seeds to have on hand, even for a minor dietary component. About 667 g of amaranth seed would satisfy the daily caloric needs of an average adult (Earle and Jones 1963; Hiles 1993:13-16). A supplement of amaranth might be equal to 1/4 or 1/3 of this figure. Taking into account weight loss during charring, the vessel originally held the equivalent of three to four adult supplement days of seeds. We can conclude that the storage of substantial quantities of weedy annuals would be necessary to maintain a family throughout the year, and we should expect to find caches of seeds in large storage vessels.

Information about the distribution of vegetal artifacts within Feature 39 comes to us on several different scales of specificity. These include point proveniences, association with specific features, vessels, or ground stone artifacts (which can be located in a photograph or by point provenience), and location by floor quad, floor half, or in relation to the area demarcated by major roof support uprights (inner or outer zone). The broadest provenience categories generally accompany flotation samples and small lots of relatively common macrobotanical remains on the floor. Yet we can put this variable information to work in some interesting ways. Loose corn kernels in floor deposits were most abundant in the northeast quad, followed by the southeast quad (Table 175; Fig. 103).

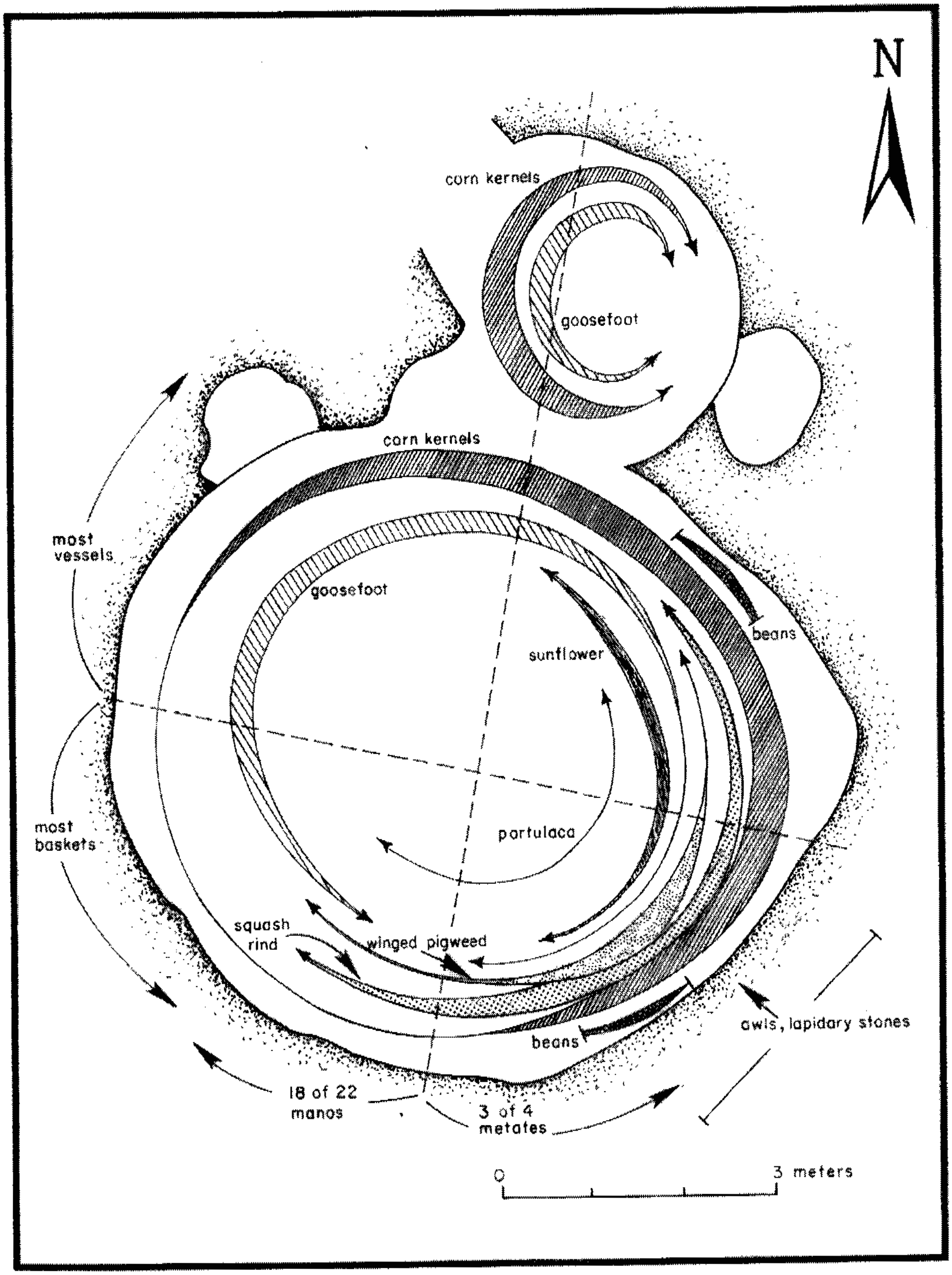

Figure 103. Patterning of plant taxa on floor of Feature 39, LA 5407.

Beans, winged pigweed seeds, and sunflower achenes follow a similar distribution. The distribution of loose food materials closely follows the patterning of *contained* food materials, implying spillage during food processing or the collapse of the roof. The majority of vessels and baskets containing corn, beans, and weedy annuals were found in the northeast and southeast quads in association with three large metates (Table 180).

The basic structure of work areas on the pit structure floor is defined by several landmarks: a hearth set slightly off of center in the northwest quad, a sizable foot drum bridging the central portions of the southwest and southeast quads, and a possible storage area in the southwest quad. In the central cooking area, vessels containing corn or weedy annuals were found on both west and east sides of the hearth. Alignment of small postholes, together with vegetal impressions in the hard-fired floor, suggest anchored partitions separating the cooking and storage areas from the foot drum. The antechamber and two exterior pits served as auxiliary storage. The predominant food processing area encompasses a broad arc of metates and associated ceramic, basketry, and cucurbit vessels in the northeast and southeast quads. An area of less intense activity is indicated in the northwest quadrant, near the entrance to the main chamber from the antechamber. Field notes record remnants of grass mats in this quadrant on the floor beneath fallen roof beams. Lacking the actual specimens for taxonomic identification (and presuming *by* their absence that this "matting" consists of unworked vegetal material rather than anything woven), we can only pose the possibilities that these "mats" delineate a sleeping area or represent waste products of corn shucking. We find the highest concentration of empty cobs in the northwest quad (Table 181), lending support to intermittent or general use of this area for shucking and other initial processing activities.

In addition to horizontal patterning of cultural materials and activities on the pit structure floor, LA 5407's floral remains allow some consideration of vertical patterning. As seen at many Southwestern sites, wood selection varied considerably according to use. Fuelwood consisted almost exclusively of local conifers, mostly piñon and juniper, but also some ponderosa pine (Tables 182 and 183). Construction material includes these same taxa for posts and beams, with willow, reedgrass, and some shrubby types such as thatch. Since the wood and earth structure collapsed onto the floor, this taxonomic distinction helped in sorting out the vertical patterning of strata. Essentially, willow and reedgrass served as markers for the presence of roof deposits. Roof-fall occurred in every vessel sitting on the floor, as well as general or upper fill of the structure. Fuel debris was found in the hearth, directly on the floor, and in an extramural pit.

LA 14906. An open campsite (possibly a hunting station), LA 14906 was situated on a low gravel terrace, more than 1 km from Largo Creek. The site consisted of four use-areas and numerous fire pits (four of which were sampled for flotation remains). Ceramic and lithic artifacts denote site use in Archaic and Pueblo periods, and predominant occupation in the Early Pithouse era.

Conifer duff, especially juniper twigs, was present in all four features, and it was abundant and carbonized in three (Table 184). Charred goosefoot seeds (FS 8-36) are the only other economic plant remains (there were no cultivars). Unburned weedy annual seeds, with questionable relation to the various human site occupations, were not numerous. They include widespread economic species (goosefoot, pigweed, purslane) and fairly useless spurge. The floral assemblage reflects the preservation limits of shallow, structureless sites and the expected low density/low variety of subsistence remains at a limited-activity campsite.

Early Pueblo Period

LA 6075. This site sits on a flat ridge-top meadow above Largo Creek. Reserve phase sherds from inside structures point to occupation in the twelfth century. Sampled proveniences include a pit structure with a floor more than 2 m below present ground surface and several much shallower ephemeral rooms constructed of stacked cobbles and jacal. Flotation samples from eight 1 by 1 m grids on this deep pit structure floor were analyzed with the hope of finding some interesting spatial patterning of plant-related activities. Although excavation notes gave promising descriptions of dark trashy organic soil lying just above the floor, these samples were consistently lacking in any kind of informative floral remains (Table 185). Description of the central, unlined heating feature suggested fill represented primary hearth deposits (multiple layers of ash and burned soil), and in fact, this was the only Feature 16 locus with economic plant materials (winged pigweed and squawberry; Table 186).

Rooms were situated much closer to the present ground surface, as more abundant unburned floral parts attest (both weedy annual seeds and conifer duff; Table 186). Cultural plant remains in the rooms were limited to charred goosefoot seeds (numerous in Feature 26), low-frequency tobacco, and burned conifer duff in Feature 27.

Two aspects of the LA 6075 floral assemblage stand out: the absence of clearly cultural plant debris anywhere on the pit structure floor and the complete absence of cultivar remains in all proveniences. Though bean and squash parts certainly have taphonomic problems that inhibit their reliable recovery at agricultural period sites, carbonized corncob fragments preserve with such dependability that their absence in 13 flotation samples is significant. Ground stone artifacts (two-hand manos, a trough metate) suggest maize processing did indeed take place, as we would expect from this Pueblo period site. We are left suspecting some anomalous preservation (or sampling) situation, which is consistent with the absence of cultivars and wild plant resources. There *should* be corn at this site.

Seasonality of site use cannot be demonstrated conclusively by the floral remains. Cultural plant debris includes only one instance (Feature 27 floor) of charred conifer parts, and single recovery loci for goosefoot, winged pigweed, tobacco, and squawberry seeds (all harvestable late summer to fall, as are the vast majority of economic plant seed and fruit crops).

LA 6076. This hillside pueblo is on a piñon-juniper-covered ridge with easy access to water (Largo Creek) and arable bottomland. The bulk of the occupation falls within the Early to Late Pueblo periods in the twelfth century and possibly into the thirteenth century (Feature 28 pit structure and Features 29, 35, 57, and 58 masonry rooms). Underlying structures (Feature 59 pit structure and Feature 60 room) may predate these occupations, but only by a short interval.

The 21 flotation samples analyzed are mostly from interior proveniences (one extramural storage pit was empty of plant remains) in both occupation intervals and a variety of structural types. With the special exception of beeweed, all weedy annual and grass seeds are unburned and probably postoccupational (Table 187). Cultural plant debris in the main occupation pit structure and rooms (Features 35 and 41/57) and in several early pit structure features largely consists of carbonized piñon and juniper duff (twigs, bark, needles, cone scales) and corn. Charred beeweed seeds are found in several early occupation proveniences (Tables 188 and 189), and a single floor sample in one of the overlying masonry rooms (FS 29-50; Table 187) contained low-frequency remnants of pricklypear and yucca, two important perennial food plants.

As with ground stone and other artifact categories, the composition of the botanical remains and their uniformity from one context to another suggests generalized trash deposits. For instance, there is no difference between contents of one Feature 29 floor fill sample (FS 29-68; Table 187) and an ash pit associated with that floor (FS 29-72). While corn in Feature 60 flotation samples appears to be restricted to the heating features (Table 189), macrobotanical remains show that corn was recovered throughout that room, in locations including floor fill, fill above roof fall, heating features, and pits (Table 190).

At LA 6076, the relative abundance of two-hand manos may be an indication of the importance of maize processing, while rarer one-hand manos and basin metates could reflect lower dietary emphasis on wild plant foods. Patterning of floral debris should help evaluate such inferences. Corn was indeed recovered often at LA 6076, though not "everywhere," or in heavy density. Only 5 of 21 flotation samples have any *Zea* remains, well below the 57 percent ubiquity noted for Classic Mimbres period sites excavated by the Mimbres Foundation (approximately 140 km to the southeast; Minnis 1985:105) or the 80 to 90+ percent ubiquity common in Anasazi sites of the San Juan Basin (Toll 1983). Macroremains expand on the cultivar picture at LA 6076, showing that corn was indeed a principal component of the plant food repertoire here. Wild weed or grass seeds, on the other hand, are rare and don't include *any* of the common edible wild taxa--goosefoot, pigweed, or purslane. Beeweed is an interesting anomaly. Ordinarily both rare and few in number, beeweed seeds (in 6 of 21 flotation samples, and 75 percent of the samples from the earlier occupation) are actually more ubiquitous than corn at LA 6076. This disturbed ground weed has multiple economic uses, few of which involve the seeds, and some are not even related to subsistence. The relatively large seeds were used "to make a flour" (Jones 1930:26), and young plants were "gathered and boiled for food" (Whiting 1939:18). The plant was also boiled down to a thick black paste, which was used as a pottery paint (Robbins et al. 1916:59; Stevenson 1915:82). A sequestered distribution, in this case in a single occupation, is consistent with such a specialized use, rather than use as a general food resource.

LA 14858. This small residential site sits on a hill just above Largo Creek and arable valley bottomland. Structures consisted of a string of masonry rooms, a large jacal room downslope, and a pit structure. Heating features were present in all three structural types. Flotation samples were taken from a masonry room floor.

The two sampled masonry rooms (Features 6 and 8) were equipped for a variety of food processing tasks, with hearths, mealing bins, and bowl rests. The slab-lined, clay-bottomed hearth in Feature 6 contained charred piñon nut and cone scale remains (Table 191). We can wonder whether this is a direct result of home-based processing for consumption or storage in this residential site within a piñon-gathering habitat. Ethnographic accounts of piñon processing refer to nuts "gathered in the cone," with the cone later "burned off the nuts near where gathered or after the return home" (Reagan 1928:146-147; see also Murphey 1959:23). Other accounts note how roasting the nuts benefits both flavor and preservation (Castetter 1935:42; Robbins et al. 1916:41; Stevenson 1915:70; Swank 1932:61). Charred corncob fragments were accompanied by ambiguous remains of unburned goosefoot seeds.

The large jacal room's hearth and ash pit contained cob fragments and a charred yucca seed, along with more unburned goosefoot seeds. Though yucca's most widespread use is as a source of fiber for containers, cordage, and clothing, the fruit was also widely eaten fresh, boiled, or roasted (Hough 1897:38; Robbins et al. 1916:49-52; Stevenson 1915:72-3; Swank 1932:75; Whiting 1939:18). Young pods were processed whole, seeds and all (Jones 1930:45), but seeds were carefully extracted and discarded from mature pods (Castetter 1935:54-6; Castetter and Underhill 1935:23; Reagan 1928:147-148). The recovery of charred goosefoot seeds in both samples from the hearth in Feature 16 (pit structure) alerts us that unburned (but eroded and oxidized) seeds of this genus elsewhere at the site should not be necessarily be considered intrusive.

Charcoal at LA 14858 was nearly all coniferous (Table 192). Juniper, piñon, and a sizable component of undetermined conifer were present. All proveniences sampled for charcoal were burn features (three hearths and an ashpit) and presumably represent fuelwood debris.

Plant remains represent major groups of wild economic annuals, perennials, and cultivars, but not in quantity or variety. Floral remains parallel other artifact categories at LA 14858 in that they are sparse (as the result of a brief occupation or because of excavation that missed areas of significant trash accumulation) but reflect the full range of subsistence activities expected at a residential site associated with agriculture.

LA 14907. Floral remains shed no light on this probable field structure, consisting of two rooms and an extramural work area. A single flotation sample from a small hearth in a cobble and mortar room produced no clearly cultural plant remains (one unburned goosefoot seed, piñon and juniper duff; Table 193). Poor preservation due to shallow deposits (floor was only 24 cm below the modern ground surface) together with presumed seasonal occupation at this limited-use site have left few artifacts of subsistence, either durable or perishable.

LA 14909. This short strip of cobble and mortar rooms was close to Largo Creek and a substantial, sheltered expanse of farmable land. Study of the floral remains was limited to a single large room, later subdivided into two features (Features 15 and 16). The floor in Feature 15, and Level 16 in Feature 16, contained charred goosefoot seeds, juniper duff, and cultivars (Table 193). Partial corncobs were also collected from Feature 16 fill during excavation (Table 190). Burned wood on the floor was almost uniformly juniper, while piñon and cottonwood/willow were represented more substantially in Level 16 (Table 194). An ash layer (Level 8) contained no recognizable plant parts or charcoal. There were no unburned floral remains in the three proveniences sampled.

Floral subsistence debris mirrors the ground stone record. The major elements of plant processing are represented, but not in any significant variety or quantity. Grinding stones include types appropriate to both wild seed and maize processing, but no mealing bins to indicate substantial emphasis on producing corn meal as a dietary mainstay. A single weedy annual seed type, goosefoot, is not much of a dietary backup, among the wide range of available wild plant food products (see Tierney 1972, 1973b).

Summary and Discussion of the Botanical Assemblage as a Whole

Cultivars

Zea mays. In most archeological assemblages, cobs form the bulk of corn assemblages, representing waste products or kindling. This was the case at LA 6076 and LA 14909, where corn assemblages were composed exclusively of cobs. In contrast, corn remains at LA 5407 were decisively dominated by kernels (yet another illustration that this site's vegetal assemblage reveals much about storage, processing, and use of food products, and not just discard). Kernels were found primarily in the northeast and southeast quads of the pit structure at LA 5407, either scattered on the floor or in storage vessels and baskets (Table 181). Cobs appear to be associated with the primary food and processing areas (northeast and southeast) and a possible shucking area (northwest).

In his substantial stratigraphic sample of cobs from Tularosa Cave, Cutler (1952) noted an early eighth-century increase in cobs with lower row numbers, which he attributes to the introduction of tripsacoid varieties from Mexico. These varieties, later referred to as *maiz de ocho* by Galinat and Gunnerson (1964), can survive in a wider range of growing conditions and are higher yielding (Sanchez and Goodman 1992:42). These traits could confer important adaptive advantages during climatic downswings, and at higher elevations, by allowing corn "to withstand variability in the timing and distribution of precipitation and to mature prior to late season deficiencies in moisture" (Upham et al. 1988:684). Galinat and Gunnerson's (1964) proposed eighth-century introduction of new, more productive and adaptable maize germ plasm has far-ranging implications for agricultural success in marginal situations (which are perhaps more the rule than the exception in the Southwest) and the development of a resource base for human population expansion. To date, this model depends entirely on archeological data, consisting of cob morphometrics (numerous *only* at Tularosa Cave), bolstered by concomitant shifts in processing tools, architecture, and settlement patterns (Diehl 1996; Wills 1988). Upham et al. (1987, 1988) present further arguments for the origins and implications of these genetic events based on material from the southern Rio Grande Valley.

In the Gallo assemblage, a distinct decrease in cob row number is apparent when Early Pueblo period sites LA 6076 and LA 14909 are compared to LA 5407 (Table 195). We are fascinated and delighted that Gallo *Zea* remains repeat the regional chronological pattern. Many of the specimens on which this model is based come from dry cave deposits with high potential for mixing and imprecise chronological associations. Reiteration of eighth-century morphometric discontinuities with multiple, well-dated collections adds confidence to the pattern. The real potential for pinning down the *causes* of the pattern lies in molecular studies of archaeological corn DNA.

In the Gallo sites, cob diameters decrease through time as well, while cupule width increases (Table 196), suggesting an increase in the size of kernels along with a decrease in row number. King (1987) discusses the relationship between processing techniques and kernel distortion. From experimental replication, she found that kernels that had been boiled or treated with alkali before carbonization displayed a greater change in size, but less distortion than unprocessed kernels. King goes on to say that the increase in size, together with a usually missing embryo, results in a crescentic shape, resembling many of the archaeological kernels examined from eastern North America. Goette et al. (1994) found that kernels boiled with wood ash and then charred most closely resembled archaeological kernels. These kernels lacked a pericarp, the point of attachment was frequently missing, and embryos were occasionally missing. Moderate kernel swelling was noted in 43 percent of the kernels from LA 5407, and loss of embryos in 33 percent (Table 197). Gross swelling was rarely observed. The condition of the Gallo kernels doesn't point clearly to boiling and/or treatment with alkali before storage and carbonization.

Morphometric data that would allow us to compare Gallo kernels with other regional populations are sadly lacking (Table 198). At Higgins Flat, Cutler (1956) estimated kernel dimensions from the rachis segment length of cobs. We know of no other actual or inferred dimensions or descriptions of corn kernels from the Quemado-Reserve area.

Phaseolus. Fifty-two beans were recovered from four proveniences at LA 5407: the antechamber storage pit, the floor of the northeast and southeast quads, and Vessel 7 in the southeast quad. Beans are relatively rare at Gallo and other sites in the Southwest, which may be due to differential preservation. Beans have a thin, fragile seed coat which can break easily, leaving the endosperm exposed to environmental factors that cause deterioration (Gasser and Adams 1981). Other seeds with tougher seed coats have a distinct preservation advantage. There is also some suggestion (deserving of experimentation) that beans rarely survive carbonization except under low-oxygen conditions. At Walpi, Gasser and Adams (1981) recovered 509 beans as opposed to a whopping 24,746 watermelon seeds. The small number of beans recovered at Gallo can be compared to approximately 265,000 winged pigweed seeds recovered from Vessel 8. We suspect that the dietary role of beans at LA 5407 was actually far more substantial than the relative quantities imply.

When the morphometrics of beans recovered at LA 5407 (Table 199) are compared to those from site 29SJ629 at Chaco Canyon (Toll 1993), the average lengths, widths, and thicknesses are nearly equal. However, the range of bean length is considerably more variable in those recovered at Gallo than at Chaco Canyon. Some size variation can be expected in beans from a single pod (smaller seeds are found in apical positions) and as a result of variable or marginal growing conditions (Kaplan 1956). At an elevation of about 2,200 m, Gallo sites are near the upper elevational limit for successful bean farming (Kaplan 1965). Though *average* size of Gallo bean specimens reflects average prehistoric dimensions of this widespread and adaptable species, morphometric *variability* may be telling us that Gallo beans are grown locally, and with some difficulty.

Cucurbits. Carbonized cucurbit exocarp occurred throughout floor fill of the burned pit structure (Feature 39) at LA 5407 (Table 200). Rind fragments of *Cucurbita* spp. are reliably distinguished from those of the white-flowered bottle gourd, *Lagenaria siceraria*. In cross section, the bulk of the exocarp is composed of regularly arranged, isodiametric parenchyma cells in *Cucurbita*, and large, elongated and poorly organized cells in *Lagenaria* (Gasser 1981; Whitaker 1948).

Bottle gourd, with a smooth rind averaging a sturdy 4 mm thick in modern specimens, was generally grown as a container. Whole fruits are typically pear-shaped with a long neck, but the shape can be altered by manipulating the fruit as it matures. Bottle gourd exocarps have been used for storage containers, rattles, canteens, cups, dippers or spoons, pottery scrapers, flutes, and prayer sticks (Whiting 1939:93-94). Though bottle gourd seeds are edible (Ford 1981:8-9,14), the flesh is bitter and of little caloric value, and it rarely figures as a food source (Whitaker 1948:53).

Contemporary indigenous peoples rely heavily on bottle gourd, among cucurbits, for containers and household implements. We know that this was not always the case from the distribution of archeological materials. The Early Pithouse pattern at LA 5407, where bottle gourd makes up only 2 percent by number or 1 percent by weight of all cucurbit exocarp (Tables 200 and 201), is repeated later and farther afield, at Zuni, Hopi, Canyon de Chelly, the San Juan Basin, and Mesa Verde (Table 202). These sites, at the latitudinal or elevational upper limit of bottle gourd's growing range, exhibit an interesting twist of circumstances: *Cucurbita* species develop relatively thick exocarps and appear to be the predominant container material. *Lagenaria* develops thinner exocarp than seen in warmer climes (Cutler and Meyer 1965:152; Table 202). Not only does bottle gourd seem to be less suitable for containers in these areas, but the absence or very rare occurrences of seeds and peduncles would suggest their appearance as a trade item rather than a local agricultural product. Two recovery instances provide contextual confirmation of use of *Cucurbita* spp. for containers: exocarp with mend holes was found at Salmon Ruin (Burgess-Terrel 1979:78), and a carbonized rind fragment from LA 5407 (southeast quad of Feature 39, FS 668) still retains a mass of charred goosefoot and pigweed seeds on the internal surface. Two assemblages in Table 202 show more substantial bottle gourd components. We know that contemporary Hopi farmers grow bottle gourds successfully, but also at Walpi, *all* large concentrations of bottle gourd remains occurred in storage, religious, or religious storage rooms (Gasser 1981:80-84). The Yamutewa house, a kiva storage room at Zuni, is another site where bottle gourd remains were found. However, the assemblage may be skewed by the presence of fragments of ceremonial rattles (Toll 1987:6).

The several species of *Cucurbita* grown by prehistoric farmers in the Southwest cannot be distinguished by their rind fragments unless one is lucky enough to be looking at a piece from near the top of the fruit surrounding the peduncle, sporting the knobby-ridged, green-striped surface of a particular variety of *C. mixta*. *C. foetidissima*, the wild buffalo gourd, can often be distinguished by its very thin (< 1 mm) and frequently twisted shell fragments.

The collection of carbonized cucurbit exocarp from LA 5407 is unusual. Most archeological cucurbit rind found in significant quantities comes from well-preserved dry sites, with very few specimens showing signs of charring. The preservation of notable quantities of burned squash or gourd shell is yet another sign that special conditions obtained here (a very hot fire, smothered quickly) preserved details of daily life in remarkable quantity and variety.

Carbonized squash seeds (all from floor fill in the southwest quad of Feature 39 at LA 5407) are slightly larger (Table 203) than maximum dimensions of wild cucurbit seeds (see Adams and Huckell 1986:293) but at the small end of the size range for seeds of cultivated *Cucurbita* species *pepo, mixta*, or *moschata*. Given the stability of seed size within any given population or species of *Cucurbita* (King 1985:87), we can reasonably interpret the Gallo specimens as representing cultivars. Carbonization unfortunately tends to obliterate important features (margin hairs, seed coat sculpturing) used to distinguish species (Gasser 1981).

Weedy Annuals

Economic annuals are represented with greatest consistency at LA 5407 (Table 204). At this site, seven taxa occur, with significant quantities of goosefoot, pigweed, winged pigweed, and sunflower present in storage vessels. Clearly these taxa at least represent real resources in the Early Pithouse diet. Goosefoot is the only annual species occurring at most Gallo sites. Additional taxa present include beeweed, groundcherry, and purslane. Tobacco was found only at LA 6075, represented by a single seed. Wild tobacco leaves, stems, capsules, and seeds have been recovered in several instances in direct association with prehistoric smoking paraphernalia or storage vessels (see Adams and Toll in prep.). Actual tobacco remains are rare in the Gallo area, but artifacts such as the stone pipes (FS 39-26, FS 39-200) in floor fill of the burned pit structure at LA 5407, stone and ceramic pipes at SU (Rinaldo 1940:74), and reedgrass cigarettes at Bat Cave (Dick 1965:84) suggest that tobacco was used.

Perennial Fruits and Nuts

Cacti, succulents, and shrubs. This category of food resources is distinctly underrepresented at Gallo sites (Table 204). Despite preservation at LA 5407 of cultivars and seeds of annuals that approach actual quantities stored and used, fruits and seeds of several available local perennial taxa are barely in evidence at this site. There are *no* cacti, squawberry, or serviceberry remains catalogued to date at LA 5407, and just a single carbonized *Yucca* pod (from trash fill in an extramural storage pit, Feature 32). Nonfood remains of these same taxa are far more abundant at this site: yucca fiber was used repeatedly in sandal construction and cordage, and squawberry twigs occurred as the foundation in many basket fragments. In small sites of the Early Pueblo period, carbonized pricklypear seeds were found in a floor sample at LA 6076, and charred yucca seeds turned up in that same LA 6076 context, as well as in an ashpit in a jacal room at LA 14858. A single charred squawberry seed was recovered from the pit structure hearth at LA 6075. Elsewhere in the region, pricklypear and hedgehog cactus seeds, and yucca fruits and seeds occur in cave deposits (Bat, Cordova, Tularosa) and open sites (Carter Ranch, Higgins Flat), but never in substantial quantities (see Table 205).

Walnuts, piñons, and acorns. Walnut remains consisted of charred whole nuts and fragments (Table 206). One whole nut, four halves, and nine fragments were recovered from LA 5407. Walnuts were found at Bat and Cordova Caves, Carter Ranch, and Higgins Flat (Table 205). Walnuts were far more prominent at Higgins Flat, where 126 whole nuts were recovered from a single room (including 100 "perhaps from" a basket; Cutler 1956:181), and scattered individual specimens were found in other parts of the site. At the Gila Cliff dwellings further south, over 2,000 whole or partial walnuts and one fruit complete with husk were recovered. The lack of carbonization and occasional rodent teeth marks led Adams and Huckell (1986:305) to suggest that some or all of these walnut remains may be intrusive. Ethnographic records of southwestern plant utilization show very few incidents of walnut use, except by the Navajos, who are relative latecomers (Castetter 1935:31).

Piñon remains were ubiquitous (Tables 207 and 208) and likely include both economic and ambient materials from the prehistoric occupation, as well as postoccupational intrusive debris. The fall-ripening piñon nut crop is an exceedingly valuable wild food resource, especially given its nearby availability. The nuts are distinguished by a particularly high energy value (635 calories per 100 grams, higher than most other plant and animal foods used prehistorically, including corn; Ford 1968:158,160). Ethnographic references to the Tewas, Isletas, and Zunis indicate the prevalence of storing nuts in the shell, sometimes preceded by roasting (Castetter 1935:40-42; Jones 1930:37; Robbins et al. 1916:41). Whole nuts are rarely recovered archaeologically, and almost always from an accidental (or intentional) burn of a storage facility. Broken, empty nutshells could be expected to occur in and around burn features or storage contexts, and anywhere food processing (or eating) took place. At Gallo, all nut remains were from LA 5407: carbonized whole nuts (n=16) were recovered strictly in Feature 39 (Table 208), the burned pit structure. Nutshell halves (n=2) and fragments were more widespread and were recovered in extramural pits, Vessel 5, the fill of an unknown basket, and Feature 25. Incidental piñon debris in LA 5407's Feature 25 included both charred and highly oxidized but uncarbonized needles, and one fragmentary needle bundle with clear evidence of spindle gall midge infestation (*Pinyonia edulicola*, "a common forest pest that rarely causes serious damage"; Cain et al. 1990:7). Charred piñon needles were found in flotation samples at LA 5407, LA 14906, LA 6075, LA 6076, LA 14858, and LA 14909, and cone scales at LA 6076 and LA 14858.

Whole acorn nuts, shell fragments, and caps have been recovered at Bat and Cordova Caves (Dick 1965; Kaplan 1963) and the Gila cliff dwellings (Adams and Huckell 1986:297). Lack of carbonization and signs of rodent gnawing led Adams and Huckell to discount these remains as probably intrusive. Some oak wood but no nut parts have turned up in Gallo sites. Both gray and gambel oaks (*Quercus grisea, Q. gambelii*) grow in the Gallo Mountain area (Tierney 1972; USDA Forest Service 1986). In contrast to many other species of oak, acorns of gambel oak are relatively tannin-poor, so that the time-consuming leaching process (used widely in California; Balls 1972:11-12) would not be needed to remove bitter-tasting tannin. Gambel oak acorns can be eaten raw and were used by Puebloan peoples from Archaic times until the present century (Dunmire and Tierney 1995:114-116).

Acorns contain lysine, an essential amino acid for human nutrition absent in corn (Dunmire and Tierney 1995:115-116). Given the predominance of corn in the Gallo diet and indications that Gallo growing conditions are marginal for beans (another important source of lysine), we could expect acorns to fill an important dietary niche. There is, however, no support in the archeological record for such a scenario.

Fiber and Reeds

Sixty-one sandal fragments were recovered from LA 5407, including three children's sandals and two whole or nearly whole adult sandals. Forty-eight pieces of cordage were also found, some of which were braided, folded, or knotted. Macroscopic examination of the cordage and sandals indicated that the material compares favorably with yucca fiber. Microscopic analysis of the fiber assemblage was not undertaken due to difficulties involved in the identification of charred fiber remains, and time and budgetary constraints. However, most of the (uncharred) sandals and cordage found at nearby Bat Cave (Dick 1965) were made from yucca fiber, suggesting a high probability that the fiber remains from LA 5407 were composed of similar materials.

Several basketry fragments had a two-rod foundation of sumac withes (*Rhus* sp.). *Rhus* has been used widely for basketry foundation in the Southwest, throughout the Puebloan territory from the prehistoric era into the present (Bohrer 1983; Mauldin 1984:14-16, Whiteford 1988).

Prehistorically, common reedgrass (*Phragmites communis*) was used widely for a variety of manufacturing and construction purposes. This plant provides strong but lightweight, straight spans of 2 m or more and requires wet soils such as those along permanent streams or springs (Hitchcock 1971:190). Common reed was frequently used as roof-closing material (as at Pueblo Bonito in Chaco Canyon, Judd 1954; see also Whiting 1939:66) and for screens and partitions (as for a corn crib at Arroyo Hondo Pueblo; Wetterstrom 1986). Manufacturing uses include arrowshafts, cigarettes, flutes, prayer sticks, and other household items (Curtin 1949:75; Reagan 1928:159; Robbins et al. 1916:66). Reedgrass inflorescence fragments, leaves, and stems were recovered from a number of contexts at the Gila Cliff Dwellings (Adams and Huckell 1986:297). At LA 5407 reedgrass was used as thatching material and was recovered from floor deposits, vessel contents, and general fill of Feature 39.

Wood

Fascinating detail about resource availability and human patterns of selection, use, and discard hides within archaeological wood assemblages. Unfortunately, we are still struggling with older data sets that include no wood species composition information, and more recent data sets where only a small percentage of proveniences can reliably be assigned a fuel or construction context. Regardless of these limitations, we can still recognize some distinct trends. Within a region, intersite variability is generally eclipsed by variability according to use (fuel verses construction), and, to an extent, by variability according to time (e.g., periods of major demographic expansion).

That is, sites in a region, of all sizes and types, tend to use wood in similar ways, which includes preferences for unique wood constellations for specific tasks. Thus, it is imprudent to combine wood data from a given site regardless of context, unless you are looking at very broad adaptive patterns over time, using a large data base.

At Gallo, a distinct pattern is seen in the substantial sample from LA 5407 and repeated in smaller samples from LA 14858 and LA 14909, which are later sites (Table 209). Thermal features and trash were composed almost exclusively of coniferous woods, primarily juniper and piñon. Roof fall included conifers, reedgrass, and willow, along with shrubby woods such as mountain mahogany and saltbush. Reedgrass and willow were such consistent components of roof-fall (as they were in the Gila Cliff dwellings; Fenner 1986) that they serve as reliable markers of roof deposits in ambiguous contexts (such as upper contents of vessels).

Despite the preponderance of unmodified wood in cave deposits, we lack comparative species composition data from Bat, Tularosa, or Cordova Caves. Farther south in the Mimbres Valley, a small sample from the Gila Cliff dwellings indicates only 16 percent coniferous wood, plus substantial proportions of riparian or canyon bottom species (38 percent, including cottonwood, willow, ash, walnut, alder, and grape) and rosaceous shrubs (36 percent; Kukachka, cited in Adams and Huckell 1986:317-318). For open sites, where wood data derive primarily from charcoal, the Museum of New Mexico's Luna project will provide some much-needed comparative framework for wood use in nearby small sites of a variety of time periods. Preliminary analyses of wood from these sites indicates there are strong components of juniper and ponderosa pine, plus smaller occurrences of cottonwood/willow, reed grass, oak, and shrubby species (Toll and McBride in prep.). In small sites of the Mimbres Valley, Minnis documents a sharp decrease in utilization of floodplain species, a corresponding *increase* in coniferous species, and presumed farming expansion of the Classic Mimbres phase (Minnis 1984:195).

Gallo Plant Remains in a Regional Context by Chronological Period

Early Pithouse Period (A.D. 200-600)

The Early Pithouse is a period of postulated casual farming, in contrast to the Puebloan era, when construction and aggregation of houses and the array of house features, durable vessels, and tools point more obviously to year-round occupation and agriculture-based subsistence (Wills 1988). But our data from the Gallo Mountain area clearly show that people who lived at LA 5407 were not hunter-gatherers, dabbling in horticulture. About 10 kg of carbonized corn kernels were recovered from the pit structure, representing about 50 kg of dried kernels. The caloric requirements of about 84 person days could have been met with corn alone. We know also, from an earlier, unanalyzed excavation at the same site, that corn, bean, and squash remains were present in another burned pit structure, and that an outdoor storage pit contained nearly 7 cu m of shelled corn.

Considerable quantities of corn and other cultigens were recovered from sites in the Mogollon Highlands with preceramic occupations, such as Cordova Cave and Tularosa Cave. On the other hand, cultigens were not recovered in large quantities from sites dating to the Early Pithouse period excavated by Martin and others. However, the size of pit structures at the SU site, the presence of large floor pits, and the recovery of grinding stones still in place on house floors indicate at least some dependence on agriculture. The preservation conditions at LA 5407 provide proof of this dependence as well as evidence of the continued importance of wild plant resources.

Wills (1989) suggests that during the Early Pithouse period, cultivation in the marginal environment of the Mogollon Highlands produced a surplus food supply for spring consumption when wild plant resources were scarce. Stored cultigens would have allowed prehistoric populations to be present in the highlands in the spring to survey the availability of wild plants that mature in the summer and fall. This interpretation "indicates some degree of competition among forager groups for fall resources and suggests that cultivation was an active tactic for improving hunting and gathering success" (Wills 1989:145).

Diehl (1996) measured the increase in maize consumption by correlating changes in ground stone attributes and maize ubiquity in flotation samples. The morphology of manos and metates suggests to him that the efficiency of grinding tools increased over time, and the ubiquity of maize recovered from intramural floor features increased from the Early Pithouse period to the Three Circle phase. Increase in the prevalence of maize may be related to differences in weather patterns. Berman's (1989) research indicates that severe drought or periods of wet, cold conditions were rarest in the Three Circle phase, providing optimal farming conditions during this period.

Early Pueblo Period (A.D. 800-1000 to 1100-1150)

Cultigens were present in low densities and numbers at the Early Pueblo sites at Gallo. The presence of deep pit structures (LA 6075), surface rooms, and two-hand manos and trough metates at Gallo is associated with other Early Pueblo sites in the area where agriculture was thought to represent a significant part of the subsistence regime (Wills 1989). The abundance of ground stone at Early Pueblo sites along with the identification of water-control features (Moore, this volume; Peterson 1988) indicates agricultural intensification in the highlands. The paucity of plant remains from sites of this time period is probably a reflection of poor preservation (see McBride 1989) and an increase in the number of ephemeral surface rooms used for storage, and not a true representation of the number and diversity of plant resources that were exploited. The Early Pueblo was a period in which population and regional site densities increased, probably resulting in a greater emphasis on the accumulation of stockpiles of cultivated and wild foods.

Summary

Our most detailed picture of Quemado area prehistoric subsistence, from LA 5407, shows substantial dietary reliance on corn and contributions from beans and squash. Several weedy annuals are stockpiled in significant quantities, while grasses and perennial fruit and nut crops such as piñon, walnut, squawberry, pricklypear, and yucca are relatively rare. At another Early Pithouse site without catastrophic burning (LA 14906), the abbreviated archaeobotanical record includes no domesticated crops and just one instance of charred goosefoot seeds. Gallo sites from the Early Pueblo period contain signs of dependence on farming at three of the five sites and a smattering of economic annuals and perennials. Comparisons of botanical abundance and diversity between time periods are seriously hampered by very different scales of available data. The meager assemblage from LA 14906 is an important warning that inferences of subsistence emphasis or agricultural success are not sustainable on botanical grounds alone. LA 5407's floral assemblage shows clearly that farming was a vital part of economic life in a period where other shallow sites with poor preservation potential show few signs of this economic foundation.

Although catastrophic burns still leave systematic holes in the record of prehistoric subsistence, they contribute some particularly important insights. These assemblages give us realistic perceptions of actual quantities of food materials and link plant remains with their contexts of use. By their study, we acquire whole new levels of detail and breadth of botanical information linked to prehistoric economic behavior, and fascinating new perspectives that inform on other sites of all preservation types and abandonment modes.

CONCLUSIONS

The Gallo project excavations add considerably to our knowledge of the prehistory and material culture of the northern Mogollon periphery in New Mexico. Some of the results confirm the conclusions of previous research; others provide data that contradict commonly held perceptions. Tables 210 and 211 summarize the information from the excavations. Sites with no features or small artifact assemblages are not included.

In the Mogollon area, sites attributed to the Early Pithouse period are widespread, with clusters at high altitudes (Stuart and Gauthier 1981:135). Locations on high knolls have suggested defensive placement (LeBlanc 1980), possibly linked to control of prime arable land (Anyon 1984:30; Minnis 1985:57). More recent studies question this linkage (Oakes 1996), pointing out that sites on lower terraces and in valley bottoms may be built over by later structures (e.g., Lekson 1992:73) or covered by alluviation, as in the case of LA 5407. Limited reliance on agricultural products (Diehl 1994:104; Lekson 1992:12; Mauldin 1993:328) is favored by some, and sedentary, or at least relatively sedentary, agricultural adaptation by others (Hard 1990:135; LeBlanc 1980; Wills 1996:352). The population was relatively sparse and dispersed, leaving early populations more subsistence options than found in the Pueblo periods.

The Gallo excavation data indicates that the area was inhabited by agricultural groups during the Early Pithouse and Early Pueblo periods, with little evidence of occupation during the Late Pithouse period. Groundwater levels from A.D. 400 to 750 and 1000 to 1275 were especially beneficial for floodplain farming but unfavorable from A.D. 750 to 925 (Dean et al. 1994:55-56). This, combined with the frequency of severe droughts that could lead to crop failure between A.D. 750 and 1000, may have caused the area to be largely deserted until conditions improved between A.D. 1000 and 1100 (Berman 1989:221).

Early Pueblo sites are much more common than sites from other periods, reflecting an increase in regional population and movement into more marginal areas (Berman 1989:46; Stuart and Gauthier 1981:138). Settlements in the northern region were small pueblos scattered around parcels of land with agricultural potential (Anyon 1984:34). Reliance on agriculture is viewed as only slightly greater than in the Early Pithouse period (Mauldin 1993:328), increased (Hard 1990:135), or heavy (Diehl 1994:114). The Gallo excavation data indicates that portions of the Early Pithouse population relied heavily on agriculture, and Early Pueblo populations, less so. Taking into consideration the different abandonment modes for sites from the two time periods, catastrophic for the early period and more orderly later, the data still indicate strong patterns (Table 210).

LA 5407, a single structure and a small number of exterior features, produced the largest samples of every artifact group. More two-hand manos, viewed as good indications of the intensity of agriculture (Diehl 1994:105; Hard 1990:137-138; Mauldin 1993:323-324; Wills 1996:349-350), are found there that at any other project site. Size ranges (the only data available for all but LA 5407) indicate that the Early Pithouse period manos are as large as if not larger than those from the later sites. In fact, the LA 5407 mean length of 18.8 cm is greater than means for Mesa Verde, Chaco Canyon, and all but one of the Mogollon Pueblo sites reviewed by Hard (1990:144-145). Reliance on corn and domestic plants is also evident in the storage of large quantities of plant resources both within and outside of the structure and the prevalence of durable plant-processing chipped stone tools. Furthermore, if this shallowly excavated structure can be considered a pit structure, it goes against notions that link subterranean dwellings with hunting and gathering and with winter sedentism (Gilman 1983:256). Both the fauna and floral assemblages indicate that LA 5407 was inhabited during the warm season. The architectural transition from pit structure and pit to surface room storage may have more to do with the form in which plants were stored--corn as kernels in the Early Pithouse period versus cobs in later periods--than with the degree of sedentism and agricultural dependence.

Agriculture during the Early Pueblo period was probably a fairly risky undertaking. The excavated Gallo sites are generally small (Tables 210 and 211) and have a range of indications for agricultural dependence. Only LA 14858 has multiple mealing bins, yet this eight-room, one-pit structure site has some of the more ephemeral architecture in the project, relatively few pieces of ground stone, fairly small two-hand manos, a predominance of brittle materials in lithic tools used primarily for animal processing, and only a single corncob representing domesticates. Corn was similarly sparse at LA 6076 and LA 14909, and absent in the macrobotanical and flotation samples from LA 6075. One pit structure at LA 6076 had metates on the floor, but no bins. Thus, the two sites with the more substantial wall construction, LA 6076 and LA 14909, lack formal grinding facilities and have very little evidence of corn itself. At least two, and probably all three of the fieldhouse sites and many of the water- and erosion-control features date to the Early Pueblo period. All of the above indicate that diverse strategies and relatively short-term occupations characterize the Early Pueblo period in the project area.

Another implication of the data from this project concerns regional interactions. Populations engage in exchange for a variety of reasons, not the least of which is information flow and maintenance of social relationships. Exchanged goods are generally of two forms: small items of high value that move large distances, and bulk, low-value items that are less widely distributed (Rice 1987:196-197). The few high-value goods, shell and malachite, are found throughout the time span represented by the Gallo sites (Tables 210 and 211), suggesting no great changes in this particular type of exchange. The same may not be true of at least one low-value, bulk item: ceramics.

Reviewing the evidence for social networks and alliances in the northern Mogollon region of Arizona, Hantman concludes that there was no meaningful boundary between the areas traditionally defined as Mogollon and Anasazi before A.D. 1000. Populations were relatively mobile, so social networks were large and unbounded. After A.D. 1000, population increased, and social networks became more bounded, that is, more distinctively Mogollon or Anasazi. These alliances were manifest in stylistic and technological aspects of ceramic production (Hantman 1984:175).

Some evidence for alliances, or at least trade relations, is seen in the Gallo ceramic petrographic data when contrasted with that from nearby Anasazi sites at Fence Lake. No gray ware ceramics were recovered from the two early sites, although brown ware ceramics from these sites do indicate exchange with other Mogollon groups. For the sample as a whole, temper in the Gallo brown ware ceramics is diverse and cuts across ceramic types, suggesting a number of production areas and active exchange within the area. Brown ware ceramics at Fence Lake are limited in the temper types represented, suggesting a specialization in production (Mills 1987b:150) for exchange or restricted trade relations. While based on fairly small samples, this interpretation seems to indicate relatively free exchange of vessels among groups considered Mogollon, represented by the Gallo sites, but restricted or limited exchange between Mogollon and nearby Anasazi groups during the Pueblo period.

While there are substantial gaps in the data collected during the Gallo project, the goals of providing basic descriptive information for the area, of contrasting the adaptations represented in the early and late sites, and of considering the nature of interaction with Anasazi groups have been met. Hopefully, the data and discussions have contributed to our understanding of the mountain Mogollon.

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APPENDIX 2: TABLES

Table 1. Excavation dates for the Gallo Project (as indicated by field logs)

```
1976
                  October                         November                       December
       1234567890123456789012345678901 123456789012345678901234567890 1234567890123456789012345678901

6074                                                         XX     X XX   XXXX
6075   X   X                 X XXXXX   XXXXX  XX
6076   X  XXXXX   XXXX  XXXXX  XXX                   X                       XX   XXXX XXXXXX
6077                                   X X
14858                                          XXXX  XXXXX  X              X


1977
                 January                    February                    March

       1234567890123456789012345678901 1234567890123456789012345678 1234567890123456789012345678901

6075                     XXX  XXXX   X   X    XXX   XXXXX  XXXX   X XXX
6076                   XXXX              X    XX                    X X
14463                                                        XXX   X XXX
14883                                                 X              XXX


                     April                           May                          June
        123456789012345678901234567890 1234567890123456789012345678901 123456789012345678901234567890

5407                                                                                          XXX   XXXX
14882                                XXXXX   XXX           X
14906                XX   XXXX   XXXXX   XX X       X  X    XXX  X
14907                 X    X  X          XXXX   XXX           X          X
14908                                           X           X               XXX   XXXX  XXXXX   XXXX  XXX
14909                                           XX  XXXX   XXXXX  XXXXX   X XXX          XX     XXXX
14910                                                      XXXXX  XXX       XX
14913                                                         X       X
14914                                                         XX       X
14917                                                                                                   XX


                    July                            August          September
       1234567890123456789012345678901 1234567890123456789012345678901 1234567890

5407   X   XXXX  XXXXX  XXXX   XXXXXXX XXXXX XXXXX
14908                      XXX  XX
14912                   X
14915            XX
14917  X
14919               X
14920  X     X
14930                                                              X   X
```

Table 2. Temporal framework for the Gallo sites

Approximate Dates (A.D.)	Period	Phase Equivalent
200 to 600	Early Pithouse	Pine Lawn
600 to 1000	Late Pithouse	Georgetown
		San Francisco
		Three Circle
900-1000 to 1100-1150	Early Pueblo	Reserve
1100-1150 to 1300	Late Pueblo	Tularosa

Table 3. Residential (R), fieldhouse (FH), and scatter/camp (S) sites, Largo and Agua Fria Creeks

Site	Type	Period	Features	Land Form	Elevation (m)	Meters from Creek
LA 5404	R	Pueblo	10-12 rooms	ridge?	2219	335
LA 5405	R	Pueblo	20 rooms, kiva	ridge	2195	365
LA 5407 (e)	R	E. Pithouse	4+ pit structures	terrace	2224	200
LA 5409 (e)	R	L. Pueblo	small pueblo	ridge	2219	120
LA 6074	R	Pithouse	3+ pit structures?	slope	2220	50
LA 6075 (e)	R	E. Pueblo	4 rooms, pit structure	flat-topped ridge	2230	275
LA 6076 (e)	R	E. Pueblo	10 rooms, 2 pit structures	side of high ridge	2213	260
LA 6077 (e)	R	E. Pueblo?	2 rooms, pit structure?	toe of a hill	2231	260
LA 14858 (e)	R	E. Pueblo	8 rooms, pit structure	hill slope	2217	200
LA 14883	R	Pithouse E. Pueblo E. Pueblo E. Pueblo	3+ pit structures 4 rooms 6 rooms, pit structure 4+ rooms, 1 pit structure	valley bottom hillside valley bottom valley bottom	2214	215
LA 14884	R	L. Pueblo	100+ rooms, great kiva	bench and valley bottom	2219	245
LA 14905	R	E. Pueblo	20 rooms, 1 pit structure	hillside	2225	380
LA 14908 (e)	R	E. Pueblo	unknown	steep hillside	2223	90
LA 14909 (e)	R	E. Pueblo	2-4 rooms	hill base	2225	150
LA 5406 (e)	FH	Pueblo	1 room?	bench	2234	60
LA 5408 (e)	FH	Pueblo	1 room	bench	2219	100
LA 5410	FH	Pueblo	1 room	valley bottom	2246	15
LA 10984	FH	E. Pueblo	2-4 rooms	terrace	2223	100

Site	Type	Period	Features	Land Form	Elevation (m)	Meters from Creek
LA 14882 (e)	FH	Pueblo	unknown	steep hillside	2214	75
LA 14907 (e)	FH	E. Pueblo	2 rooms	low knoll	2216	500
LA 14910 (e)	FH	E. Pueblo	1 room	valley floor	2233	90
LA 14914 (e)	FH	E. Pueblo?	1 room?	valley floor	2237	46
LA 5411 (e)	C	Archaic?	fire pit	slope	2286	885*
LA 14906 (e)	C	E. Pithouse +	fire pits, use surface	low terrace	2215	1220
LA 14917 (e)	C	Archaic?	fire pit?	level bottom land	2303	800*
LA 14920 (e)	C	unknown	scatter	rocky bench	2268	180
LA 14930 (e)	C	unknown	scatter	valley bottom	2312	1630*
LA 15101	C	unknown	quarry	ridge slope	2294	1370

e= excavated; * = from Agua Fria Creek
Sources: ARMS forms; Kayser 1973; Kayser and Dart 1977; and this report

Table 4. Mean distance to Largo or Agua Fria Creeks by site type and elevation

Site Type	N	Mean Distance (m)	SD	Mean Elevation (m)	SD
Residential	14	224.6	99.2	2219.6	8.8
Pithouse	3	155.0	91.2	2219.3	5.0
Early Pueblo	11	238.6	84.4	2218.3	10.2
Late Pueblo	2	182.5	88.4	2219.0	0.0
Fieldhouse	8	67.0	29.9	2227.7	11.4
Camp/Scatter	6	1014.2	511.1	2279.7	35.1

Table 5. Dendrochronological and radiocarbon dates, LA 5407

Feature	Provenience	Number	Species	Dates A.D.
Dendrochronological*				
Feature 25	SW quad	HWS-45	pnn	265p-485++vv
	SW floor fill	HWS-48	pnn	241+p-470++vv
	post, south half	HWS-46	pnn	301p-497++vv
	south floor fill	HWS-49	pnn	426p-516+r

Feature 39	SE floor fill	HWS-53	pnn	294p-462++r
	NE quad	HWS-58	pnn	263p-470++v
	SE quad	HWS-65	pnn	339p-478++vv
	NE quad	HWS-63	pnn	308p-492vv
	NE quad	HWS-60	pnn	383-515+r
	NE quad	HWS-59	pnn	431p-516+r
	NE quad	HWS-61	pnn	448p-516+r
	NE quad	HWS-62	pnn	410p-516+r
	NE quad	HWS-66	pnn	409p-516+r
	NE quad	HWS-51	pnn	432p-517+r
	NE quad	HWS-64	pnn	441p-517+r
Radiocarbon Dates				
Feature 25	NW quad	28744		500 ± 50
Feature 39	NW quad	28743		250 ± 50 235 ± 50**

* 12 other dendrochronological samples did not date
** corrected

Table 6. Posthole diameters of structure, LA 5407 (cm)

Feature	Postholes	N	Range		Mean	SD
			Minimum	Maximum		
Antechamber	east diagonals	15	7	16	9.76	3.18
	vertical north and west	13	7	16	10.92	2.56
	vertical between chambers	10	10	15	12.80	1.50
	interior supports	3	14	16	14.60	1.10
Main chamber	diagonals	41	7	16	11.07	2.30
	vertical perimeter	30	5	13	9.56	1.92
	interior supports	9	15	29	22.67	5.17
West pit area		5	6	12	10.20	2.48
Feature 29 area		13	5	9	6.92	1.40

Table 7. Summary of pit characteristics, Feature 27 (cm), LA 5407

Feature	Top	Bottom	Depth	Fill	Comments
Bell-shaped pits					
30	82 x 89	186	115	mixed, organic	7 postholes; clay lined; woody plants and corn
32	54 x 56	120 x 126	140	sandy, charcoal	trash filled; small seeds; 6 postholes: 12-20 cm dia., mean 13.3, SD 3.5
36	60	155 x 170	144	sandy	burned roof material at bottom
Storage pits					
33	40		10	sandy/volcanic	
35	60		20	sandy/volcanic	
37	52 x 36		20	sandy/volcanic	
38	48	42	12	sandy/volcanic	
Mixing pits					
43	35 x 50		9		
none	25 x 37		9-10		

Table 8. Nonarchitectural feature ceramic distribution, LA 5407

	General Surface				Feature 6											Feature 7				Feature 8			
	Surface		Backdirt		10-16 N							16-23 N				12-14 E 10-20 N				14-16 E 9-17 N			
					0-40 cm		40-50 cm		50-100 cm			10-40 cm		40-60 cm		20-35 cm		50-70 cm		0-50 cm		50-60 cm	
	J	B	J	B	J	B	J	B	J	B	O	J	B	J	B	J	B	J	B	J	B	J	B
Alma Plain	8		45	2	9	4	22	1	8		1*	33	1	22	2	10	1	13		42		27	
Alma Smudged				1													2				2		4
Mogollon Brown																1				2			
San Francisco Red		1	2	2	1	1	1	1		1		1	1	1	1	2		6	4	3	2		
San Francisco Red, smudged																					1		1
Tularosa Patterned Corrugated																							
Total	8	1	47	9	10	6	23	2	8	1	1	34	2	23	3	13	3	19	4	47	5	27	5

Table 8 (continued)

	Feature 9						Feature 10				Feat. 11	Feat. 12		Feat. 13		Feat. 15, 16		Feat. 19-24
	16-18 E						18-20 E				20-22 E	22-24 E		24-26 E		28-32 E		36-48 E
	4-15 N			16-25 N			2.5-20 N				12-19 N	9-14 N		7-18 N		4 S-17 N		0-17 N
	0-50 cm	55-75 cm		0-55 cm	95-110 cm		0-55 cm		60-75 cm		40-75 cm	10-25 cm		0-55 cm		10-45 cm		0-50 cm
	B	J	B	J	J	B	J	B	J	B	J	J	B	J	B	J	B	J
Alma Plain	3	9		43	16		13		79		19	1		4	1	6		25
Alma Smudged					1			3										
Mogollon Brown					2													1
San Francisco Red					1	2		3		2	1							1
San Francisco Red, smudged			1															
Tularosa Black-on-White													1					
Wingate Black-on-red																	1	

	Feature 9						Feature 10				Feat. 11	Feat. 12		Feat. 13		Feat. 15, 16		Feat. 19-24
	16-18 E						18-20 E				20-22 E	22-24 E		24-26 E		28-32 E		36-48 E
	4-15 N			16-25 N			2.5-20 N				12-19 N	9-14 N		7-18 N		4 S-17 N		0-17 N
	0-50 cm	55-75 cm		0-55 cm	95-110 cm		0-55 cm		60-75 cm		40-75 cm	10-25 cm		0-55 cm		10-45 cm		0-50 cm
	B	J	B	J	J	B	J	B	J	B	J	J	B	J	B	J	B	J
Total	3	9	1	43	20	2	13	6	79	2	20	1	1	4	1	6	1	27

J = jar; B = bowl; * scoop

Table 9. Ceramic distribution by feature, LA 5407

Feature:	26		27		40		Pits								42	28			
Meters north:	7-12		13-16		12-14		F.30		F.32	F. 35	F. 36		F. 37			13-14			
Meters east:	22-26		18-22		18-19											12-13			
Level (cm):	35-55		60-100		40											surface		110-120	
Ware/Form:	J	B	J	B	J	B	J	B	J	J	J	B	J	B	J	J	B	J	B
Alma Plain	29		191	3	102		19		30	142	8				3	2	11*	4	
Alma Smudged				1				1											
Mogollon Brown		1	5						1								8		
San Francisco Red			17	8	3	14	2		2	13		1	1	1					1
Totals	29	1	213	12	105	14	21	1	33	155	8	1	1	1	3	2	19	4	1

J = jar; B = bowl; * = small pinch pot

Table 10. Ceramic distribution, antechamber (Feature 25), LA 5407

Ceramic Type	Fill (70-120 cm)		Floor Fill (0-10 cm above floor)			Floor	Feature 34	Totals		
	J	B	J	B	R	J	J	J	B	R
Alma Plain	215		598		2	53	32	898		2
Mogollon Brown	6		6					12		
San Francisco Red	28	13	20	59				48	72	
San Francisco Red Smudged		1							1	
Reserve/Tularosa		1							1	
Totals	249	15	624	59	2	53	32	958	74	2

J = jar; B = bowl; R = restorable jar

Table 11. Ceramic distribution, main chamber (Feature 39), LA 5407

Ceramic Ware	General Fill			Floor Fill										Floor Contact			
				Northeast			Southeast		Northwest		Southwest			Northeast			
	J	B	PJ	J	B	WJ	J	PJ	J	B	J	B	PJ	J	B	WJ	BL
Alma Plain	762		1	46		1	37	1	184		147			9		5	
Alma Smudged		1								6							
Mogollon Brown	1	12					2					1	1	1			
San Francisco Red	34	6			37		20		1	5	1			4	1	1	
San Francisco Red, smudged		2															
Basket liner																	1
Totals	797	21	1	46	37	1	59	1	185	11	148	1	1	14	1	6	1

Ceramic Wares	Floor Contact								Features		Feature 29		Subfloor	Total				
	Southeast			Northwest			Southwest		Fill									
	J	B	PJ	J	WJ	PJ	J	BL	J	B	J	B	J	J	B	WJ	PJ	BL
Alma Plain	72		1	11	3	1	141		34	1			1	1444	1	9	4	
Alma Smudged															7			
Mogollon Brown														4	13		1	
San Francisco Red	2	2							2	3	3	4		67	58	1		
San Francisco Red, smudged															2			
Basket Liner								1		1s					1			2
Total	74	2	1	11	3	1	141	1	36	5	3	4	1	1515	82	10	5	2

J = jar; B = bowl; WJ = whole jar; PJ = partial jar; BL = complete basket liner vessel; s = sherd from a basket liner vessel

Table 12. Summary of ceramics, LA 5407

Ceramic Ware	Sherds					Vessels*		
	Jar	Bowl	Other	Total	Percent	WJ	PJ	BL
	3326	30	1	3357	88.5	10	4	
Alma Smudged	1	22		23	0.6			
Mogollon Brown	28	22		50	1.3		1	
San Francisco Red	173	176		349	9.2	1		
San Francisco Red Smudged		6		6	0.2			
Tularosa Patterned Corrugated		4		4	0.1			
Tularosa Black-on-white		1		1				
Reserve/Tularosa Black-on-white		1		1				
Wingate Black-on-red		1		1				
Basket Liner		1		1				2
Totals	3528	264	1	3793	99.9	11	5	2

* includes only those vessels recorded as whole or partial by the ceramic analyst
WJ = whole jar; PJ = partial jar; BL = basket liner

Table 13. Vessel type and form for selected proveniences, LA 5407

Provenience	Alma Plain		Mogollon Brown		San Francisco Red	
	Jar	Bowl	Jar	Bowl	Jar	Bowl
Strip features	401	13	6	0	20	21
Feature 27	530	14	6	9	38	25
Antechamber	898	0	12	0	48	72
Main chamber	1444	1	4	13	67	58
Site total	3326	30	28	22	173	176

Table 14. Vessel size and characteristics, LA 5407

FS and Vessel Numbers	Provenience	Type	Rim (cm)	Maximum diameter (cm)	Height (cm)	% Present	Comments
39-798 V1	floor, NE	Alma Plain	7.5	12.0	11.5	100	poorly smoothed; irregular
39-792 V3	floor, NE	Alma Plain	8.0	17.0	16.5	100	smoothed
39-793 V4	floor, NE	Alma Plain	12.0	17.0	19.5	100	smoothed
39-789 V5	floor, NE	Alma Plain	11.0	27.0	24.0	100	smoothed
39-796 V6	floor, NE	Basketliner	38.2		11.1	100	filled with corn
39-795 V7	floor fill, SE	Mogollon Brown	14.0	24.0	26.0	55	burnished; rim cracked and warped
39-784 V8	floor, NE	Alma Plain	11.0	26.0	23.0+	75	smoothed; sketchily burnished; fire clouds
39-788 V9	floor, SW	Basketliner				98	
39-797 V10	floor, NW	Alma Plain	8.0	21.0	21.0	99	burnished; fire clouds
39-786 V12	floor, NE/NW	Alma Plain	8.5	12.0	13.0	98	burnished; fire clouds
39-794 V13	floor, NW	Alma Plain	12.5	28.0	30.0	100	smoothed; burnished; fire clouds
39-791 V14	floor, NW	Alma Plain	10.5	24.0	23.5	70	burnished; soot deposit on interior
39-799 V2	floor, NE	San Francisco Red	6.0	16.5	19.5	98	burnished
39-481	floor fill	Mogollon Brown	8.5	12.8	14.0+	?	coils not smoothed
39-20 or 39-422	fill, NE 155 cm	Alma Plain	10.0	16.5	15.5	100	smoothed; burnished; interior soot; prefiring crack mended
39-135	fill, NW 155 cm	Alma Plain	12.0	24.0	25.0	60	smoothed; floated; burnished; fire clouds
39-132,152	fill, SE 155 cm	Alma Plain	10.0	25.0	23.0	?	smoothed
39-136, 929,930	fill, NW 155 cm	Alma Plain	13.0	27.5	24.5	?	smoothed
39-136	fill, NW 155 cm	Alma Plain	?	33.0	?	25	burnished; fire clouds
39-136	fill, NW 155 cm	Alma Plain	11.5	24.0	25.0	25	burnished; fire clouds

FS and Vessel Numbers	Provenience	Type	Rim (cm)	Maximum diameter (cm)	Height (cm)	% Present	Comments
39-51	fill, NW	Alma Plain	9.5	18.5	23.0	95	smoothed; burnished; fire clouds
39-composite	135 cm to floor	Alma Plain	10.5	26.0	33.0	30	burnished; fire clouds
39-composite	135 cm to floor	Alma Plain	9.0	22.0	23.0	70	smoothed
39-composite	135 cm to floor fill	Alma Plain	13.5	34.0	35.0	50	smoothed; burnished
39-542	fill, SE	Alma Plain	12.0	20.0	20.0	20	smoothed; lightly burnished
39-composite	floor fill	Alma Plain	22.0		10.7	95	bowl; burnished; fire clouds; 1 sherd called San Francisco Red
39-787	floor, NW	Alma Plain	40.0		9.5	65	bowl
39-composite		San Francisco Red	11.0			20	jar mouth and neck
39-composite	fill, NW	Alma Plain	9.0	?	40.0+	?	rim and neck only
25-195	antechamber south half	Alma Plain	9.5	28.0	23.0	80	smoothed; floated; lightly burnished; fire clouds
25-195	antechamber south half	Alma Plain	12.0	29.0	27.5	85	smoothed

Table 15. Ground stone provenience distribution, LA 5407

Feature	Mano	Metate	Lapidary	Polisher	Polishing Stone	Slab Cover	Maul	Anvil	Mano/ Metate	Abrader	Unidentified	Unidentified Chipped Stone	Total
Unknown				2									2
F.41 (dog)	1												1
F.0 (strip zone)	1	3	1								1		6
F.8 (strip zone)	1			1									2
F.9 (strip zone)	1												1
F.11 (strip zone)				1									1
F.13 (strip zone)	1												1
F.26 (pit)	1												1
F.27 (trash)											2	1	3
F.30 (pit)	1					1				1			3
F.32 (pit)	2	1	1										4
F.35 (pit)											1		1
F.36 (pit)					1							1	2
F.40 (trash)	1					1							2
Antechamber F.29 (pit)	6	1	2	3	3			1			2		18
Main chamber	28	14	9	7	12	5	6		1		3	2	87
Total	44	19	13	14	16	7	6	1	1	1	9	4	135

Table 16. Mean dimensions of two-hand manos, LA 5407 (cm)

Dimension	Length	Width	Thickness
Mean	18.8	11.1	5.7
Standard Deviation	1.9	2.2	1.2
Range	16.5-23.7	5.8-17.5	4.1-8.1
Number of values	16	18	18

Table 17. Mean dimensions of polishers, LA 5407 (cm)

Dimension	Length	Width	Thickness
Mean	11.5	8.6	4.6
Standard Deviation	1.4	1.5	1.5
Range	9.6-14.3	5.6-11.4	1.9-6.8
Number of Values	13	12	13

Table 18. Mean dimensions of polishing stones, LA 5407 (cm)

Dimension	Length	Width	Thickness
Mean	5.2	4.0	2.6
Standard Deviation	2.0	1.1	1.2
Range	3.0-7.0	2.2-6.0	1.1-6.0
Number of Values	15	15	15

Table 19. Mean dimensions of lapidary stones, LA 5407 (cm)

Dimension	Length	Width	Thickness
Mean	22.4	16.6	6.2
Standard Deviation	7.1	5.1	2.8
Range	9.8-37.0	7.8-24.5	1.1-11.2
Number of Values	10	10	10

Table 20. Dimensions of complete slab covers, LA 5407 (cm)

Length	Width	Thickness
15.0	13.2	2.2
24.0	21.2	5.7
23.0	22.0	3.2
25.5	18.7	2.9*
35.5	28.0	1.9

* in situ storage pit cover

Table 21. Maul dimensions, LA 5407 (cm)

Type	Length	Width	Thickness
Full grooved, noncobble	16.6	7.5	6.0
	13.2	11.2	7.4
	15.7	8.8	5.8
	19.2	9.9	7.2
Full grooved, cobble	13.7	7.8	5.4
Small basalt	8.2	5.3	2.7

Table 22. Coiled basket foundation type distribution, LA 5407

Foundation Type		Stitch	n
Single element	single rod	indeterminate	1
	bundle	indeterminate	1
	bundle with rod core	noninterlocking	1
Stacked	half rod and bundle	noninterlocking	1
	rod and bundle	noninterlocking	1
	two rods stacked	indeterminate	2
Bunched	two rod and welt	split	1
		indeterminate	3
		noninterlocking	3
	two rod and bundle	noninterlocking	3
		indeterminate	1
	two rod and indeterminate element	indeterminate	1

Foundation Type		Stitch	n
Single element	single rod	indeterminate	1
Total			19

Table 23. Distribution of coiled basket fragments, Feature 39, LA 5407

Provenience	Number of Fragments
Floor contact	7
Floor fill	8
Fill	3
Lost provenience	1
Total	19

Table 24. Cord and ply twist combinations, LA 5407 (all cordage is two ply)

Cord Twist	Ply Twist	Frequency
Z	S	9
Z	untwisted	20
S	Z	4
S	untwisted	8
untwisted	untwisted	5
indeterminate	indeterminate	2
Total		48

Table 25. Sandal warp frequencies, LA 5407 (sandals whose warp numbers could be determined)

Warp Number	Frequency
5	3
6	12
At least 6	4
6 to 8	2
8	4
10	2
Total	27

Table 26. Dimensions of children's sandals, LA 5407 (cm)

Portion	Length	Toe Width	Heel Width	No. of Warps
Toe fragment	8.3*	7.0	absent	6-8
Heel fragment	3.4*	5.0*	5.0	5
Heel fragment	2.8*	6.5	absent	5

* incomplete

Table 27. Mean widths of fragmentary sandals, LA 5407 (cm)

Portion	N	Mean	SD	Range (Min.-Max.)
Toe	10	8.9	1.0	7.6-10.6
Heel	6	7.6	1.3	5.8-9.0
Midsection	6	6.9	.8	5.9-8.5

Table 28. Level distribution of sandals in Feature 39, LA 5407

Provenience	Frequency
Floor	30
Floor fill	11
Fill	20
Total	61

Table 29. Specimens listed as wooden tools on the field specimen (FS) sheets, LA 5407

FS Number	Provenience	Field Identification
39-203	SW quad	possible wooden tool
39-215	hearth fill	worked burnt wood
39-218	SE quad, inner zone	wooden tool fragment
39-220	SE quad, floor	wooden tool fragment
39-240	SE quad, floor	wooden tool fragment
39-292	SE quad	wooden tool fragments
39-456	SE quad, floor fill	wooden tool fragment
39-477	SW quad	wood (possible shaft)
39-501	NE quad, floor	wooden tool

39-510	NE quad, outer zone	wooden tool fragment
39-671	SE quad, inner zone	possible wooden tool

Table 30. Summary of faunal remains from LA 5407

Taxon (Common Name)	Elements		MNI		% Burned	
	N	%	Minimum	Maximum	Complete	Partial
Sylvilagus sp. (cottontail)	122	12.0	5	18	19.7	1.6
Lepus sp. (jackrabbit)	87	8.6	4	19	31.0	10.3
Small sciurid	1	.1	1	1		
Large sciurid	1	.1	1	1		
Thomomys bottae (pocket gopher)	25	2.5	6	8		
Dipodomys ordii (Ord's kangaroo rat)	2	.2	1	1		
D. spectabilis (banner-tailed kangaroo rat)	63	6.2	7	9		
Cricetidae	1	.1	1	1		
Peromyscus sp. (mouse)	2	.2	2	2		
Neotoma sp. (woodrats)	29	2.7	5	10		3.4
Microtis sp. (microtine rodents)	2	.2	1	1		
Small rodent	15	1.5		1		
Small-medium rodent	83	8.2		1		1.2
Medium-large rodent	4	.4				
Large rodent	2	.2		1	50.0	
Rodent	2	.2				
Canis sp. (canid)	2	.2	1	2		
C. familiaris (dog)	13	1.3	1	1		
Felis rufus (bobcat)	7	.7	1	4	14.3	
Small carnivore	2	.2	2	2	50.0	
Carnivore	3	.3		1		
Cervidae (deer or elk antler)	13	1.3			46.1	
Odocoileus hemionus (mule deer)	8	.8	1	4	62.5	12.5
Antilocapra americana (pronghorn)	7	.7	1	5	57.1	
Bison bison (bison)	1	.1	1	1		
Corvus corvax (raven)	1	.1	1	1		

Taxon (Common Name)	Elements		MNI		% Burned	
	N	%	Minimum	Maximum	Complete	Partial
Meleagris gallopavo (turkey)	1	.1	1	1		
Small bird	2	.2		1	50.0	
Medium bird	6	.6		3	16.7	
Large bird	6	.6		3		
Bufo sp. (toad)	1	.1	1	1		
Reptile or amphibian	2	.2		1		
Small mammal	178	17.6			14.6	.6
Small mammal or large bird	15	1.5				
Small-medium mammal	12	1.2			8.3	
Medium mammal	4	.4		2		
Small-medium mammal or large bird	30	3.0			10.0	
Medium-large mammal	50	4.9		1	10.0	
Large mammal	172	17.0			27.3	.6
Artiodactyl	21	2.1		4	19.0	
Very large mammal	14	1.4		6	21.4	
Unknown	1	.1				
Totals	1013	100.1	46	119		
Burned	176	17.4				
Weathered	77	7.6				
Rounded	350	34.5				
Carnivore gnawed	13	1.3				

Table 31. Percent of immature and young adult specimens, LA 5407

Taxon	N	% Immature	% Young Adult
Sylvilagus sp.	122	3.3	4.9
Lepus sp.	87	4.6	6.9
Thomomys bottae	25	4.0	
Dipodomys ordii	2	100.0	
Dipodomys spectabilis	63		6.3
Peromyscus sp.	2		50.0
Neotoma sp.	29	3.4	13.8
Small rodent	15	6.7	13.3

Small-medium rodent	83	6.0	7.2
Large rodent	2		50.0
Small mammal	178	1.1	.6
Small carnivore	2	50.0	

Table 32. Faunal remains from miscellaneous proveniences at LA 5407

Taxon	F.6 12-16N F.7 12-14N F.9 12-18N	F.7 24-26N F.9 18-20N	F.9 1.5N F.12 F.13	F.26	F.28	F.41 F.42
Sylvilagus sp.						2
Lepus sp.	3	2	1			
Thomomys bottae	1		1*			2
Rodent						1
Canis sp.				1		
Canis familiaris						13**
Small carnivore	1					
Cervidae						2
Antilocapra americana	1					
Small mammal	1					3
Small-medium mammal						7
Medium-large mammal	2	1	1	1		
Large mammal	1	2			1	4
Artiodactyl	3					
Very large mammal	3		2			
Total	16	5	5	2	1	34
% Burned	18.7	60.0			100	2.9
% Weathered	75.0	40.0	80.0	100	100	2.9
% Rounded						23.5
% Carnivore gnawed	6.2	20.0				

* = partial skeleton

Table 33. Dog measurements, LA 5407 (after Haag 1948)

Maxilla: Right Side (mm)		
I^1 to M^2	8.45	
C to M^2	6.92	
P^2 to M^2	4.87	
P^4	1.86	
M^1 to M^2	1.95	
Mandibles (mm)		
	Right	Left
C to M_3	7.95	8.10
P_1 to M_3		6.40
M_1	2.04	2.00
P_2 to M_3	5.75	5.15
P_3 to M_3	4.10	4.20
M_1 to M_3	3.15	3.30
Z	11.72	
Long Bones (cm)		
Femur length		12.65
Tibia length	13.00	12.90
Radius length	12.25	
Ulna length	14.56	

[?] ** = partial skeleton and scattered elements; probably the same individual.

Table 34. Faunal remains from Features 27 and 40 and associated pits, LA 5407

Taxa	Fill (60-90 cm)	Feature 30	Feature 32	Feature 36	Total
Sylvilagus sp.	6	10	46	14	76
Lepus sp.	3	5	12	7	27
Small sciurid			1		1
Large sciurid			1		1
Thomomys bottae			12	2*	14
Dipodomys spectabilis			59		59
Peromyscus sp.				1	1
Neotoma sp.	1		21	2	24
Small rodent			13		13
Small-medium rodent	3	3	75		81

Taxa	Fill (60-90 cm)	Feature 30	Feature 32	Feature 36	Total
Canis sp.		1			1
Felis rufus		2		2	4
Small carnivore			1		1
Carnivore			2		2
Odocoileus hemionus	1			1	2
Cervidae			1		1
Corvus corvax	1				1
Small bird			1		1
Medium bird		1	4		5
Large bird	1			2	3
Snake?			2		2
Small mammal	3	5	103	3	114
Small mammal/large bird		1	1	3	5
Small-medium mammal		1		1	2
Medium mammal		1			1
Small-medium mammal or large bird	22				22
Medium-large mammal	5	4	10	3	22
Large mammal	6	61	9	9	85
Artiodactyl		1	2	3	6
Very large mammal		2		1	3
Unknown		1			1
Total	52	99	376	54	581
% Burned	11.5	3.0	11.2	1.8	8.9
% Weathered	13.5	3.0	.3	7.4	2.6
% Rounded	48.1	68.7	47.3	51.8	51.5
% Carnivore gnawed	1.9	2.0		9.2	1.4

* = partial skeleton

Table 35. Faunal remains from the antechamber (Feature 25), LA 5407

Taxon	Fill	Floor Fill East Half	Floor Fill West Half	Total
Sylvilagus sp.	2	8	5	15
Lepus sp.	4	4	9	17
Thomomys bottae		1	2	3

Dipodomys ordii		2		2
Dipodomys spectabilis		3		3
Cricetidae	1			1
Neotoma sp.	1		1	2
Small rodent		1		1
Small-medium rodent	1	1		2
Rodent	1			1
Felis rufus			1	1
Odocoileus hemionus			1	1
Cervidae	3		1	4
Antilocapra americana			2	2
Bison bison	1			1
Large bird	1		1	2
Small mammal	8	7	14	29
Small mammal or large bird	1	4	2	7
Small-medium mammal		1	1	2
Medium to large mammal		4	8	12
Large mammal	11	6	10	27
Artiodactyl	3		2	5
Very large mammal	1		1	2
Total	39	42	61	142
% Burned	23.1	7.1	11.5	13.4
% Weathered	25.6	11.9	6.6	13.4
% Rounded	17.9	50.0		19.7
% Carnivore gnawed		2.4		.7

Table 36. Faunal remains from the main chamber (Feature 39), LA 5407

Taxon	Fill	Floor Fill				Floor			Feature Fill	Subfloor	Total
		NE	NW	SE	SW	NW	SE	SW			
Sylvilagus sp.	4	3	6	1	3				12		29
Lepus sp.	11	4	6	4	2	1	6		3		37
Thomomys bottae	3			1							4
D. spectabilis	1										1
Peromyscus sp.				1*							1
Neotoma sp.	1	1								1	3
Microtis sp.			2								2
Small rodent									1		1
Medium-large rodent	3						1				4
Large rodent	1							1			2
Felis rufus				1	1						2
Carnivore									1		1
O. hemionus	2		1		2						5
Cervidae	3			1			1		1		6
A. americana	2				1		1				4
M. gallopavo	1										1
Small bird					1						1
Medium bird								1			1
Large bird	1										1
Bufo sp.		1									1
Small mammal	2	2	9		2	1	1	1	12	1	31
Small mammal or large bird	2				1						3
Small-medium mammal						1					1
Medium mammal		1			1		1				3
Small-medium mammal or large bird	3										3
Medium-large mammal	7								1		8
Large mammal	23	1	6	1	12	2	1	9	5		60
Artiodactyl	3			1	2				1		7
Very large mammal			1				1	1	1		4

Taxon	Fill	Floor Fill				Floor			Feature Fill	Subfloor	Total
		NE	NW	SE	SW	NW	SE	SW			
Total	73	13	31	11	28	5	13	13	38	2	227
% Burned	48	38	32	73	36	60	77	85	13	50	43
% Weathered	16	8	13		4	20	8	8			9
% Rounded	12		3		11				5		7
% Carnivore gnawed	1	8									1

* = partial skeleton

Table 37. Bone tools and ornaments, LA 5407 (all are from Feature 39)

FS Number and Type	Provenience	Taxon/Element	Maximum Shaft Length Butt Width (cm)			Comments
39-623 awl	SW quad	artiodactyl metatarsal	6.05+		.94	tip missing; manufacture: butt end unmodified; stria; wear: edges rounded and smooth; grooves
39-592 awl	SE quad	large mammal long bone shaft fragment	3.93+		1.51+	midsection; manufacture/wear: stria
39-593 awl	SE floor fill	*O. hemionus* left dist. metatarsal	9.35+	2.08		tip missing; manufacture: butt end ground and polished; edges polished; small cuts above condyle
39-221, 39-654 awl	SE floor fill	artiodactyl metapodial	7.13+		1.18	butt end missing; manufacturing: stria perpendicular to edges; wear: deep stria perpendicular to shaft; polish
39-639 awl	SE quad floor	*O. hemionus* right metatarsal	20.0	2.03	1.34	complete; manufacture: stria perpendicular to shaft, diagonal to edges; not well finished; tip round in cross section
39-628 awl	floor fill	*A. americana* right metatarsal	10.9	1.96	1.24	complete; manufacture: stria perpendicular to shaft; highly polished
39-629 awl	SE quad floor	*Lepus californicus* metapodial	4.13		.35	complete; manufacture: diagonal cut removing proximal end; cut is ground and polished
39-638 awl	NE quad floor	artiodactyl metapodial	5.40+	1.00		fresh break midshaft; manufacture: edges round and polished; tip broken then reused
39-618, 39-620 awl	SE floor fill	*O. hemionus* left metatarsal	20.85+	2.13	1.46	tip missing; manufacture: few stria; edges highly polished; small cuts midshaft
39-187 tube	NE floor fill	large bird (not turkey) right femur	2.64		1.19	complete; manufacture: ends polished; stria parallel to shaft; cuts at both ends
39-101 tube	NW quad	large mammal long bone	2.96+		1.31+	fragment; may be part of 39-128; manufacture: bevel cut; stria at ends
39-40 tube	west half	large mammal long bone	6.29		2.39	complete; manufacture: crude, 1 end flaked; other has small cuts and was snapped
39-784 unknown	in Vessel 8	large to very large mammal; rib or long bone	9.30		.76	complete; manufacture: none; wear: slight rounding and polish; possible stirring implement
39-191 ornament?	SE quad floor	medium to large mammal rib	4.41		.80	broken at one end; manufacture: surface ground and polished

FS Number and Type	Provenience	Taxon/Element	Maximum Shaft Length Butt Width (cm)			Comments
39-649 ornament?	SW floor fill	large mammal long bone	2.65+		.84	fragment; manufacture: small stria, edges modified and polished
39-68 awl-like	NW quad	Cervidae antler	5.46		1.83	tip end; manufacture: edges ground and polished
39-? unknown	fill	Cervidae antler	10.61+		2.38	base fragment; manufacture: end cut off flat and ground; small cuts above the end
39-114 unknown	west half floor fill	large mammal long bone chip	2.63		1.48	complete; manufacture: edges ground flat, U- and S-shaped edges

Table 38. Communal structure floor and floor fill materials, LA 5407

Material	Antechamber								Main Chamber						
	NW	NE	SW	SE	E	W	S	Total	NW	NE	SW	SE	W	S	Total
CERAMICS: Sherds	29	18	227	159	37	298		768	210	98	297	133		32	770
Vessels						1		1	4	7	1	2			14
Reconstructed							2	2	5	1		1	1		8
Basketliners										1	1				2
LITHICS: Debitage	6	7	4	7	6	18		48	72	98	35	63	28	1	297
Cores										5					5
Scrapers	1	2	3					6	4	3	4	3	2		16
Knives				3		1		4			3	1	1		5
Biface										1					1
Projectile points		1						1		3	3	1			7
Other tools									1			1			2
Hammerstones	1							1		2	1	2			5
Chopper									1						1
GROUND STONE: Manos	3		1	1				5	7	1	10	4			22
Metates	1							1	2	3	6	3	1		15
Lapidary/base	1							1	2			4			6
Polishers	3							3	2	5	4	3			14
Other ground	1	1	1		2			5	2						4
Mauls									1	1	2	1	1		6
BONE: Unworked					42	61		103	53	17	54	24		6	154
Awls										1	1	7			9
Tube										1					1

Material	Antechamber								Main Chamber						
	NW	NE	SW	SE	E	W	S	Total	NW	NE	SW	SE	W	S	Total
Other												1	1		2
BASKETRY: Baskets									2	1	6	4	1	1	15
Sandals									6	20	5	10			41
Matting, cord, etc.			1	1				2	2	6	6	8	1		23
MISCELLANEOUS: Pigment						2		2	2	5	10	3	1		25
Mineral				1				1				1			1
Shell											4	2			6
Other ornament										1	1	2			4
Pipe fragments				1				1				1	1		2
Wooden tools									1	2	1	7			11
MACROBOTANICAL: Corn									1	2	4	5			12
Corncobs	1		1	1	1	2		6	3	3	2	6	3	1	18
Squash/gourd										4	3	6	1		14
Beans						2		2		2					2
Walnuts									1	2		1			4
Piñon nuts						1		1			1				1
"Nut"					1	1		2	1		1		2		4
"Seeds"									1	2	3	4			10
Other				1				1		1		2			3

Counts are from the artifact analysis except for the miscellaneous and macrobotanical material, which are FS entries.
Only two of the other ornaments and one pipe fragment were confirmed by the analysis.

Table 39. Excavation unit characteristics, LA 6074

Feature No.	Maximum Depth (cm)	Rock Content	Comments
1	10	few	
2	25	few	traces of charcoal at 10-25 cm
3	25	football size	
4	25	many	traces of charcoal at 0-10 cm
5	25	north ½ many	
6	25	north ½ many	
7	10	north ½ many	
8	25	north ½ many	charcoal chunk at 25 cm
9	10	few	
13	15?	unknown	yellow pine growing in unit
14	24 to 40	many	charcoal spot in north corner

Table 40. Ceramic summary, LA 6074

Ceramic Type	Bowl	Jar	Total
SURFACE: Reserve Indented Corrugated		3	3
FILL: Reserve Smudged	1		1
Reserve Plain Corrugated		1	1
Brown Ware body		7	7
TOTALS	1	11	12

Table 41. Test unit information, LA 6075

Feature No.	Unit size (m)	Depth (cm)	Fill Characteristics	Screened?	Comments
1	1 by 22 and 1 by 12	0-15	light brown forest loam; roots	yes	bisects F.16 and F.26
		15-25	similar, color slightly lighter		
		25-50	off white volcanic ash sediments		
		50+	volcanic conglomerate cobbles		
2	2 by 8	0-30	light brown silty humus	no	lithics only
4	1 by 9	0-15	loam	no	
		15-30	loam, few rocks		

		30-45	no information		
5	1 by 6	0-15	loam; many rocks	no	partially overlies the rooms
		15-30	no information		
6	1 by 10	0-45	forest loam with sand/tufa	no	sterile at 45 cm except in F.26
7	1 by 6	0-15	loam	no	no cultural material
		15-30	no information		
8	4 by 4.5	0-45	forest loam; few rocks	no	partially overlies F.26
9	2 by 4	0-45	dark brown forest loam	no	no cultural material
10	1 by 2	0-30	dark brown forest loam, occasional rocks	no	
11	1 by 2	0-30	dark brown forest loam, occasional rocks	no	
12	1 by 2	0-45	dark brown forest loam, occasional rocks	yes	
13	1 by 6	0-45	dark brown forest loam, occasional rocks	yes	mostly lithics
14	2 by 6 & 1 by 4	0-15	forest loam, scattered rock	yes	sparse cultural material
15	2.5 by 8	0-60	forest loam and rocks	yes	trash midden in NE
18	5 by 7	0-45	dark brown forest loam	yes	sparse cultural material
19	2 by 7.5	0-45	dark brown forest loam	yes	sparse cultural material
22	1 by 5	0-30	forest loam, rocks at 30 cm	no	no cultural material
23	1 by 5	0-25	forest loam, rocks at 25 cm	no	no cultural material
24	1 by 5	0-25	forest loam over sterile pink tufa/sand	no	no cultural material
33	1 by 8	0-15	dark forest loam, roots	yes	ash and charcoal, trash?
		15-30	same plus hard cloddy soil		small olla in Grid A
		30-45	hard cloddy soil or caliche stained loam		
		45-75	caliche stained loam over pink tufa/sand		Grid B only
34	1 by 12.5	0-10	rocky forest loam, some ash	no	
		10-20	sterile tufa		
35	1 by 2	0-20	loose forest loam, some ash	yes	trash area
		20-30	sterile caliche streaked hard clay		

Table 42. Ceramics, Feature 16, LA 6075

Ceramic Ware	Fill			Floor Fill				Floor Features			Floor Contact			Totals			
	J	B	T	J	B	L	T	J	B	T	J	B	T	J	B	L	T
Alma Plain		1	1						1	1					2		2
Alma Textured	1		1											1			1
San Francisco Red				4			4							4			4
Brown Ware body	7	52	59	4	14		18		3	3				11	69		80
Brown Ware body, smudged interior		19	19		15		15								34		34
Reserve Black-on-white	10	6	16		1	1	2	3		3	1	2	3	14	9	1	24
Reserve Incised Corrugated	4		4	1			1							5			5
Reserve Indented Corrugated	9		9					2		2	1		1	12			12
Reserve Plain Corrugated	11	4	15	8			8	1		1	3		3	23	4		27
Reserve Plain Corrugated Neck Banded	2		2	1			1							3			3
Reserve Plain Corrugated Smudged		6	6		1		1					1	1		8		8
Reserve Punched Corrugated	1		1														1
Reserve Smudged		5	5									2	2		7		7
Tularosa Black-on-white	1		1									1	1	1	1		2
Cibola White Ware mineral paint	1	1	2											1	1		2
White Ware, Group II	5		5											5			5
White Ware, Group III	2		2	1			1							3			3

Ceramic Ware	Fill			Floor Fill				Floor Features			Floor Contact			Totals			
	J	B	T	J	B	L	T	J	B	T	J	B	T	J	B	L	T
White Ware, undecorated	5		5	2			2	1		1				8			8
Totals	59	94	153	21	31	1	53	7	4	11	5	6	11	92	135	1	228

J = jar; B = bowl; L = ladle; T = total

Table 43. Trash area ceramics, LA 6075

Ceramic Ware	Test Trench 33							Test Trench 35		
	0-15 cm		15-30 cm		30-45 cm		Total	0-15 cm		
	J	B	J	B	J	B		J	B	Total
Alma Incised			1*				1			
San Francisco Red			1				1			
Brown Ware body		23	1	20			44		18	18
Brown Ware body, smudged interior	3			6			9			
Red Ware body						5	5			
Reserve Black-on-white	7		6	1		1	15	3		3
Reserve Incised Corrugated			1		1		2			
Reserve Indented Corrugated			2				2	1		1
Reserve Plain Corrugated	4	4	1	3	4		16	3		3
Reserve Plain Corrugated, neck banded			2				2			
Reserve Plain Corrugated Smudged		1		1			2			
Reserve Punched Corrugated								1		1
Socorro Black-on-white					1		1			

Tularosa Black-on-white				2			2			
White Ware, Group III			2				2	2		2
White Ware, undecorated	2		1		1		4			
St. Johns Black-on-red		1					1			
Totals	16	29	18	33	7	6	109	10	18	28

* = restorable miniature vessel; J = jar; B = bowl

Table 44. Surface and test trench ceramics, LA 6075

	SITE Surface			Feature 1					Feat. 4			Feat. 5			Feat. 6			Features										
				Sur	0-30 cm		30+ cm											8	10	12			13		14	18		
	B	L	T	B	J	B	B	T	J	B	T	J	B	T	J	B	T	B	J	J	B	T	J	B	B	J	B	T
Alma Plain										2	2		1	1														
Alma Textured					1			1							1		1											
San Francisco Red					1			1																				
Brown ware body	1		1	4	1	23	10	38	1	1	2		2	2		5	5	2			3	3		1	1		1	1
Brown body, smudged interior						2		2		1	1					1	1								1			
Red ware body					1			1																				
Reserve Black-on-white		1	1		1	1		2	2		2													2				
Reserve Incised Corrugated					1			1																				
Reserve Indented Corrugated																										1		1
Reserve Plain Corrugated					1			1		1	1	1	3	4					1					2				
Reserve Plain Corrugated, neck-banded												1		1						2		2						
Reserve Plain Corrugated, smudged						2		2													1	1						
Tularosa Black-on-white													1	1														

	SITE Surface			Feature 1					Feat. 4			Feat. 5			Feat. 6			Features										
				Sur	0-30 cm		30+ cm											8	10	12			13		14	18		
	B	L	T	B	J	B	B	T	J	B	T	J	B	T	J	B	T	B	J	J	B	T	J	B	B	J	B	T
White ware, Group II									1		1																	
White ware, Group III								10		10													3					
White ware, undecorated							1			1														1			1	1
Total	1	1	2	4	8	38	10	60	4	5	9	2	7	9	1	6	7	2	1	2	4	6	3	6	2	1	2	3

Table 45. Ceramics, rooms and vicinity, LA 6075

Ceramic Wares	Feature 15			Feature 19			Feature 27			Feature 28			F. 32	Feature 26				
							Fill			Fill			Fill	Fill		Floor		Total
	J	B	T	J	B	T	J	B	T	J	B	T	J	J	B	J	B	
Alma Plain		2	2												1			1
San Francisco Red				1		1												
Brown Ware body	6	24	30		1	1		6	6		3	3		12	16		3	31
Brown Ware body, smudged		6	6		1	1		1	1						2		1	3
Reserve: Black-on-white	1	2	3				2		2				1	1	5			6
Incised Corrugated	4		4											2				2
Indented Corrugated	3		3				1		1					1				1
Plain Corrugated	5	1	6	1		1	1	1	2	1		1		1				1
Plain Corrugated Neck-banded										2		2						
Plain Corrugated, smudged		1	1		1	1												
Smudged															9			9

Ceramic Wares	Feature 15			Feature 19			Feature 27			Feature 28			F. 32	Feature 26				
							Fill			Fill			Fill	Fill		Floor		Total
	J	B	T	J	B	T	J	B	T	J	B	T	J	J	B	J	B	
Tularosa Patterned Corrugated		1	1					1	1		1	1			2		1	3
Cibola White Ware, mineral paint																1		1
White ware, Group III	4		4															
White ware, undecorated	2		2											1		1		2
Totals	26	37	63	2	3	5	4	9	13	3	4	7	1	18	35	2	5	60

J = jar; B = bowl; T = total

Table 46. Summary of ceramics from LA 6075

Ceramic Ware	Jar	Bowl	Ladle	Total
Alma Plain		8		8
Alma Textured	3			3
Alma Incised	1			1
San Francisco Red	7			7
Brown Ware body	32	237		269
Brown Ware body, smudged interior	3	56		59
Reserve Black-on-white	38	21	2	61
Reserve Incised Corrugated	14			14
Reserve Indented Corrugated	21			21
Reserve Plain Corrugated	47	19		66
Reserve Plain Corrugated, neck banded	11			11
Reserve Plain Corrugated, smudged		15		15
Reserve Punched Corrugated	2			2
Reserve Smudged		16		16
Tularosa Black-on-white	1	4		5
Tularosa Patterned Corrugated		6		6
Socorro Black-on-white	1			1
Cibola White Ware, mineral paint	2	1		3
White Ware, Group I	6			6
White Ware, Group II	14	10		24
White Ware, undecorated	17	2		19
St. Johns Black-on-red		1		1
Red Ware body	1	5		6
Totals	221	401	2	624

Table 47. Ground stone artifact provenience distribution, LA 6075

Provenience/Artifact Type	Number	Percent
General Site: Two-hand mano	2	12.5
Metate	1	6.3
Rubbing stone	1	6.3
Lapstone	2	12.5

Provenience/Artifact Type	Number	Percent
Miscellaneous	3	18.8
General site total	9	56.3
Pit Structure Fill: Lapstone	1	6.3
Rubbing stone	1	6.3
Maul	1	6.3
Fill total	3	18.8
Pit Structure Floor Fill and Floor Contact: Two-hand mano	1	6.3
Miscellaneous	2	12.5
Floor fill and contact total	3	18.8
Feature 26: Lapstone	1	6.3
Site Total	16	100.2

Table 48. Summary of faunal remains from LA 6075

Taxon (Common Name)	Specimens		MNI		Burning		Flotation		
	N	%	Minimum	Maximum	Partial	Complete	N	%	Burned *
Sylvilagus sp. (cottontail)	22	15.8	3	6	9.1	9.1	26	6.9	19.2
Lepus sp. (jackrabbit)	38	27.3	4	7		23.7	12	3.2	25.0
Small sciurid							1	.3	
Large sciurid	8	5.7	1	3		12.5	25	6.6	16.0
C. gunnisoni (prairie dog)	18	12.9	2	2					
S. variegatus (rock squirrel)	1	.7	1	1					
T. bottae (pocket gopher)	9	6.5	3	3			3	.8	
Perognathus sp. (pocket mouse)							2	.5	
D. spectabilis (kangaroo rat)							1	.3	
Peromyscus sp. (mice)							4	1.1	
Cricetidae							1	.3	
Neotoma sp. (woodrat)	1	.7	1	1	100.0		1	.3	
Small rodent	2	1.4					53	14.1	7.5
Medium-large rodent	4	2.9					20	5.3	5.0

Taxon (Common Name)	Specimens		MNI		Burning		Flotation		
	N	%	Minimum	Maximum	Partial	Complete	N	%	Burned *
Rodent	5	3.6					8	2.1	
A. americana (pronghorn)	2	1.4	1	1					
Small bird							3	.8	
Small mammal	15	10.8				33.3	200	53.0	26.5
Small mammal or large bird							1	.3	
Small-medium mammal							1	.3	
Medium-large mammal	3	2.2					2	.5	50.0
Large mammal	5	3.6		2					
Artiodactyl	4	2.9		1		66.7			
Unknown	2	1.4					4	1.1	22.2
Unknown small							9	2.4	
Totals	139	99.8	16	27			377	100.2	
Burned	22	15.8					72	19.1	
Weathered	42	30.2					13	3.4	
Rounded							29	7.7	

* burning is complete

Table 49. Faunal remains from Feature 16, LA 6075

Taxon	Fill	Vent Fill	Floor Fill and Contact	Total	Flotation		
					Floor Fill and Pit	Hearth	Total
Sylvilagus sp.	7	1	3	11	18	3	21
Lepus sp.	6	14	2	22	7	1	8
Small sciurid					1		1
Large sciurid	1	2	1	4	20	4	24
C. gunnisoni	1*	17		18			
S. variegatus	1			1			
T. bottae	3	4	2	9	3		3
D. spectabilis					1		1
Peromyscus sp.					4*		4
Cricidae					1		1
Neotoma sp.	1			1	1		1

Taxon	Fill	Vent Fill	Floor Fill and Contact	Total	Flotation		
					Floor Fill and Pit	Hearth	Total
Small rodent			1	1	44*		44
Medium-large rodent		4		4	17	1	18
Rodent			5	5	5	1	6
Small bird					3		3
Small mammal		4	2	6	154	32	186
Small mammal large bird					1		1
Small-medium mammal					1		1
Medium-large mammal					2		2
Large mammal			1	1			
Artiodactyl	4			4			
Unknown			2	2	2		2
Unknown small					9		9
Totals	24	46	19	89	249	42	336
% Burned	12.5		5.3	4.5	4.8	92.9	16.7
% Checked/etched	4.2	63.0	5.3	34.8	3.7		3.3
% Rounded					5.8		5.1

* = one partial skeleton

Table 50. Faunal remains from the other features, LA 6075

Taxon	Feature 18 (15-60 cm)	Feature 26		Feature 27 Flotation	Feature 33		Feature 35
		Fill	Flotation	Floor Association	Fill (15-30 cm)	Flotation (0-45 cm)	
Sylvilagus sp.	1	9	1	1	1	3	
Lepus sp.	2	13	2		1	2	
Large sciurid	1	3	1				
Perognathus sp.						2	
Small rodent		1				9	
Medium-large rodent			1			1	
Rodent				1		1	
Antilocapra americana							2
Small mammal	2	7	8	1		5	
Medium-large mammal	3						
Large mammal	4						
Unknown			1			1	
Totals	13	33	14	3	2	24	2
% Burned	7.7	48.5	92.9	66.7	50.0	16.7	
% Checked/etched	23.1	18.2				8.3	100.0
% Rounded				33.3		45.8	

Table 51. Structure dimensions, LA 6076 (m)

Feature	North/ Diameter*	South	East/ Diameter*	West	Area (sq m)
28	3.24	3.12	2.07	2.67	8.8
29	5.60	6.18	3.03	2.89	17.4
31	5.80	4.65	2.60	2.25	12.7
32	2.03	1.83	2.00	1.84	3.7
34	2.18+	2.20	2.24	2.16	4.8
35	1.60		2.70		4.3
42	5.20				16.3
43	2.70*		2.30*		6.2
44	.95*		2.10*		2.0
49	1.15*		3.40*		3.9

Feature	North/ Diameter*	South	East/ Diameter*	West	Area (sq m)
50	2.78*		3.40*		9.4
51	3.50	3.50	3.00	3.00	10.5
57	1.71	1.25	1.81	1.86	2.7
58	2.22	2.53	1.50	2.10	4.3
59	2.46	3.29	2.02	1.77	6.4
59, Vent Area	.70*		.70*		.5
60	3.20*		2.50*		8.0

* [?]

Table 52. Dimensions of bell-shaped pits, Feature 59, LA 6076 (cm)

Pit Number	Top Diameter	Bottom Diameter	Pit Depth
1	13	24	55
2	15	28	43
3	14	21	53
4	18	25	32

Table 53. Distribution of selected series in the earlier and later rooms of LA 6076

Age	Feature	% Reserve	% Tularosa	% Indented White Ware	Sample Size
Earlier	Feature 59	31.6	0.0	37.2	196
	Feature 60	30.2	11.3	13.2	53
Later	Feature 28	64.2	6.4	3.8	313
	Feature 29	41.9	15.1	1.3	317
	Feature 35	37.2	4.1	8.3	121

Table 54. Ceramic distribution of surface, check dam, and Feature 39, LA 6076

Ceramic Wares	Surface		Stripping			Check Dams		F. 39	
	J	B	J	B	O	J	B	J	B
Alma Textured				5			2		
Alma Neck-banded			2						
Brown Ware body	66		330	10		153		1	
Brown Ware body, smudged		27	15	73		1	29		
Reserve: Black-on-white	17	4	54	16		19	7		
Incised Corrugated	1		3			4			
Incised Corrugated, smudged							1		
Indented Corrugated	15		93			19			
Indented Corrugated, smudged		1	3	11		1	2	1	
Indented Corrugated Neck-banded	1		5			1			
Plain Corrugated	60		184	1		65			
Plain Corrugated, smudged	1	2		13			17	1	
Plain Corrugated, Tularosa variety			1	2					
Plain Corrugated Neck-banded			3					10	
Punched Corrugated	5		16			3			
Punched Corrugated, smudged		1	2					1	
Smudged		2		25			2		1
Tularosa: Black-on-white	7		18	8	2	2	4		
Patterned Corrugated	3		33			4		1	
Patterned Corrugated Neck-banded			1						
Patterned Corrugated, smudged		2		1			3		
Patterned Corrugated, Reserve variety	3		5			2			
Cebolleta Black-on-white				1			1		
Gallup Black-on-white							1		
Red Mesa Black-on-white				1					

Socorro Black-on-white	1								
Unidentified Black-on-white			2	1	2				
Cibola White Ware, mineral paint	1		4	2		5	2		
White Ware, slipped & polished	3	4	32	9	2	12	1		
Indented White Ware, Group I			10			1			
Indented White Ware, Group II	6		26			8			
Indented White Ware, Group III	1		5			3			
St. Johns Black-on-red				1					
Puerco Black-on-red				4					
Wingate Black-on-red				1			1		
White Mountain Red Ware				7			1		1
Totals	191	43	847	192	6	304	74	15	2

J = jar; B = bowl; O = other

Table 54 (continued)

Ceramic Wares	14D, 14E, 14F, 15E				14H, 14I, 14J				Feature 27 (fire pit)			Feature 62
	0-45 cm		45-90 cm		15-30 cm		30-60 cm		J	B	O	B
	J	B	J	B	J	B	J	B				
Alma Plain										1*		
Alma Textured								1				
Brown Ware body	27		15		8		34		4	1		
Brown Ware body, smudged		6		5		2		6	1		1	
Reserve: Black-on-white	6	2	3	3	2		3	3	5			
Black-on-white glaze	1		1									
Incised Corrugated					1							
Incised Corrugated, smudged		2										
Indented Corrugated	3		3		2		2		2			
Indented Corrugated, smudged		1			1		4					
Plain Corrugated	30		4	1	6		12		5			
Plain Corrugated, smudged		1		1		2		4				

Plain Corrugated neck-banded									1			
Punched Corrugated			2		1		2					
Punched Corrugated, smudged								2				
Smudged		8		4				1		2		
Tularosa: Black-on-white	1		4		2		1					
Patterned Corrugated	2		3		2							
Patterned Corrugated neck-banded							1					
Patterned Corrugated, smudged						1						
Patterned Corrugated, Reserve variety	1											
Cebolleta Black-on-white									1			
Cibola White Ware, mineral paint	1	1				1				1		
White ware, slipped and polished	3	1		1	2			1	2			
Indented white ware, Group I					1		6					
Indented white ware, Group II	2		2		3		1		1			
Indented white ware, Group III			1		2		1					
St. Johns Black-on-red		1										
Puerco Black-on-red				1		2						
Wingate Black-on-red						1						1
White Mountain Red Ware		8										
Totals	77	31	38	16	33	9	67	18	22	5	1	1

J = jar; B = bowl; O= other; * whole vessel

Table 55. Ceramic distribution, deeper tests, Features 27 and 62, LA 6076

Ceramic Wares	N. T.T.	11F		11I, 12H, 12I, 12J		13F, 13G			13H, 13J			
	0-60 cm	15-30 cm		15-77 cm		0-60 cm			15-45 cm		45-60 cm	
	J	J	B	J	B	J	B	O	J	B	J	B
Brown Ware body	3	2		16	2	7			34		3	
Brown Ware body, smudged			1	2	8		5			3	1	1
Reserve: Black-on-white	1		1			2			4	2		
Incised Corrugated, smudged					1							
Indented Corrugated				5		1			4		1	
Indented Corrugated neck-banded									1			
Plain Corrugated				13		4	1		14		4	
Plain Corrugated, smudged					1					9		1
Punched Corrugated				1								
Punched Corrugated, smudged									1			
Smudged			1		4					4		
Tularosa: Black-on-white				1								
Patterned Corrugated		1				1			1			
Patterned Corrugated Neck-banded									3			
Patterned Corrugated, smudged										2		1
Patterned Corrugated Reserve variety						1			14		1	
Unidentified Black-on-white								1				
Cibola White Ware, mineral paint				1								
White ware, slipped and polished				1								
Indented white ware, Group I											10	
Indented white ware, Group II				1		1						
Indented white ware, Group III											1	
Puerco Black-on-red										1		1
White Mountain Red Ware							1					1
Totals	4	3	3	41	16	17	7	1	76	21	21	5

J = jar; B = bowl; O = other

Table 56. Ceramic distribution, Feature 28, pit structure, LA 6076

Ceramic Ware	F.37	Fill			Roof Fall			Below Roof Fall		Floor Fill and Associated		Room Totals		
	J	J	B	O	J	B	O	J	B	J	B	J	B	O
Alma Textured			1										1	
Brown Ware body		30	2		1			8		5		44	2	
Brown Ware body, smudged			18			1		1	1		2	1	22	
Reserve: Black-on-white	1*	8	1					2	1	1		12	2	
Incised Corrugated, smudged			1										1	
Indented Corrugated		17	1		5			5		9		36	1	
Indented Corrugated, smudged		3	2			1						3	3	
Indented Corrugated, neck-banded		1										1		
Plain Corrugated	8	71	2		2			3		4		88	2	
Plain Corrugated, smudged			2			2			2		7		13	
Plain Corrugated, Tularosa variety			1								1		2	
Plain Corrugated, neck-banded		11						2				13		
Punched Corrugated		3						1				4		
Punched Corrugated, smudged											1		1	
Smudged			16			1			2				19	
Tularosa: Black-on-white			1						1				2	
Patterned Corrugated		4			1			1		1		7		
Patterned Corrugated, neck-banded		8						1				9		
Patterned Corrugated, Reserve variety										2		2		
Unidentified Black-on-white				1			1		1				1	2
White ware slipped and polished		4	2									4	2	
Indented white ware, Group I		3						1				4		
Indented white ware, Group II		1										1		
Indented white ware, Group III		1			1					5		7		
Wingate Black-on-red			1										1	
Totals	9	165	51	1	10	5	1	25	8	27	11	236	75	2

J = jar; B = bowl; O = other; * partial vessel

Table 57. Ceramic distribution, Features 29 and 31 (rooms), LA 6076

Ceramic Ware	Feature 29										Feature 31					
	Fill		Floor Fill Contact		Feature Fill		Subfloor		Room Total		Fill		Floor Fill		Room Total	
	J	B	J	B	J	B	J	B	J	B	J	B	J	B	J	B
Alma Textured								1		1				1		1
Three Circle Neck-banded	1								1		1				1	
Brown ware body	86		3		5		2		96		4		21	1	25	1
Brown Ware body, smudged		10		6		1		1		18				4		4
Reserve: Black-on-white	12	6	1	2		1			13	9			1		1	
Black-on-white glaze	1								1							
Incised Corrugated													1		1	
Incised Corrugated, smudged												1				1
Indented Corrugated	21	1	2		1				24	1				1		1
Indented Corrugated, smudged	1	7		1		1			1	9				1		1
Indeterminate corrugated neck-banded	3								3				1		1	
Plain Corrugated	30		3						33		3		32		35	
Plain Corrugated, smudged	1	4							1	4		2		3		5
Plain Corrugated, neck-banded	6								6		1				1	
Punched Corrugated	2								2				1		1	
Smudged		15		3		2		6		26						
Tularosa: Black-on-white	7								7				1		1	
Patterned Corrugated	15		8		2				25							
Patterned Corrugated, neck-banded	5		4		1				10							
Patterned Corrugated, smudged		2								2						
Patterned Corrugated, Reserve variety	4								4							
Unidentified Black-on-white	1					1			1	1						
Cibola White Ware, mineral paint	1								1							
White ware, slipped and polished	5	3		1					5	4						
Indented white ware, Group I													3		3	
Indented white ware, Group II	2				1				3							
Indented white ware, Group III	1								1							
Puerco Black-on-red		1								1						
Wingate Black-on-red		1								1		1		1		2
White Mountain Red Ware		2								2				5		5
Totals	205	52	21	13	10	6	2	8	238	79	9	4	61	17	70	21

J = jar; B = bowl

Table 58. Ceramic distribution, Features 34, 35, 43, 50, and 51 (rooms), LA 6076

Ceramic Ware	F. 34		Feature 35						F. 43		F. 44	F. 50	F. 51
	All		Fill		Floor Fill Subfloor*		Room Total		All		30 cm	Floor	0-25 cm
	J	B	J	B	J	B	J	B	J	B	J	J	J
Alma Neck-banded	1						1						
Brown Ware body	10	1	18	1			28	2	3				1
Brown Ware body, smudged		1	1	16		6	1	23		8			
Reserve: Black-on-white	3		1		1*		5						
Black-on-white glaze													1
Incised Corrugated, smudged		1						1					
Indented Corrugated	6						6		2				
Indented Corrugated, smudged				1				1		2			
Plain Corrugated	5		5				10		8		1		
Plain Corrugated, smudged		4		1				5					
Plain Corrugated, neck-banded			2				2						
Punched Corrugated			1				1						
Smudged		2		4		7		13		1			
Tularosa: Black-on-white	3			1			3	1					
Patterned Corrugated			1				1		5			1	
Patterned Corrugated, smudged										1			
Cibola white ware, mineral paint	1	1	1				2	1					
White ware, slipped and polished	1		3				4						
Indented white ware, Group I	6		1				7						
Indented white ware, Group II	1		2				3						
Totals	37	10	36	24	1	13	74	47	18	12	1	1	1

Table 59. Ceramic distribution, Features 41 (undifferentiated Features 57 and 58), 57, and 58, LA 6076

Ceramic Wares	Feature 41						F. 57		Feature 58					Totals		
	Fill			Floor Fill			All		Fill			Pit				
	J	B	O	J	B	O	J	B	J	B	O	J	B	J	B	O
Alma Textured		1			1										2	
Brown Ware body	44	1		27			3		9	1		5		88	2	
Brown Ware body, smudged		18		2	10			2		8			8	2	46	
Reserve: Black-on-white	12	6		3	1		1		5	3			1	21	11	
Black-on-white glaze				1										1		
Incised Corrugated									1					1		
Indented Corrugated	9			6			2		2			2		21		
Indented Corrugated, smudged	3	1							1					4	1	
Indented Corrugated, neck-banded	6								2			1		9		
Plain Corrugated	30			8			2		3			2		45		
Plain Corrugated, smudged	2	1		1	1									3	2	
Plain Corrugated, Tularosa variety	2													2		
Plain Corrugated, neck-banded	1								2					3		
Punched Corrugated	1			1										2		
Smudged		25			3										28	
Tularosa: Black-on-white	4		1	3	1				2				1	9	2	1
Patterned Corrugated	2								2					4		
Patterned Corrugated, Reserve variety	1													1		
Unidentified Black-on-white						1					1					2
Cibola White Ware, mineral paint	3	1		2										5	1	
White ware, slipped and polished	1	6											2	1	8	
Indented white ware, Group I	1													1		
Indented white ware, Group II	9			3										12		
Puerco Black-on-red		2													2	
White Mountain Red Ware					2										2	
Total	131	62	1	57	19	1	8	2	29	12	1	10	12	235	108	3

J = jar; B = bowl; O = other

Table 60. Ceramic distribution, Features 59 (pit structure) and 60 (room), LA 6076

Ceramic Wares	Feature 59								Feature 60					
	Fill		Fl. Fill		Features		Total		Fill		Floor Fill		Total	
	J	B	J	B	J	B	J	B	J	B	J	B	J	B
Alma Textured										2				2
Alma Neck-banded	2						2							
Brown Ware body	22		11		8		41		7		6		13	
Brown Ware body, smudged			2	2	2		4	2	3	2			3	2
Reserve: Black-on-white	10	2	1		1	1	12	3	4		1		5	
Incised Corrugated									2				2	
Incised Corrugated, smudged		1						1						
Indented Corrugated	2		5				7		2				2	
Indented Corrugated, smudged		1						1		2				2
Indented Corrugated, neck-banded	1						1							
Plain Corrugated	15		3				18		3				3	
Plain Corrugated, smudged		4						4						
Plain Corrugated, neck-banded	2		1		2		5							
Punched Corrugated	1		1				2							
Punched Corrugated, smudged	5						5			1				1
Smudged		1		1		1		3		1				1
Tularosa: Black-on-white									2	1	2		4	1
Patterned Corrugated									1				1	
Cebolleta Black-on-white										1				1
Unidentified Black-on-white	1						1							
Cibola White Ware, mineral paint			1		1		2					1		1
White ware, slipped and polished	2			2	2	1	4	3	1		1		2	
Indented white ware, Group I	29		16				45		6				6	
Indented white ware, Group II	1				1		2							
Indented white ware, Group III	15		10		1		26							
White Mountain Red Ware		2						2		1			1	
Total	108	11	51	5	18	3	177	19	31	11	10	1	42	11

J = jar; B = bowl

Table 61. Summary of ceramics from LA 6076

Ceramic Wares	Jars	Bowls	Other	Totals N	Totals %
Alma Plain		1		1	
Alma Textured		15		15	.4
Alma Neck-banded	6			6	.2
Three Circle Neck-banded	2			2	
Brown Ware body	1042	20		1062	28.9
Brown Ware body, smudged	31	291	1	323	8.8
Reserve: Black-on-white	185	63		248	6.7
Black-on-white glaze	5			5	.1
Incised Corrugated	13			13	.3
Incised Corrugated, smudged		8		8	.2
Indented Corrugated	248	3		251	6.8
Indented Corrugated, smudged	18	35		53	1.4
Indented Corrugated, neck-banded	23			23	.6
Plain Corrugated	642	5		647	17.6
Plain Corrugated, smudged	6	84		90	2.4
Plain Corrugated, Tularosa variety	3	4		7	.2
Plain Corrugated, neck-banded	44			44	1.2
Punched Corrugated	42			42	1.1
Punched Corrugated, smudged	9	5		14	.4
Smudged		145		145	3.9
Tularosa: Black-on-white	60	18	3	81	2.2
Patterned Corrugated	95			95	2.6
Patterned Corrugated, neck-banded	24			24	.6
Patterned Corrugated, smudged		13		13	.3
Patterned Corrugated, Reserve variety	34			34	.9
Cebolleta Black-on-white	1	3		4	.1
Gallup Black-on-white		1		1	
Red Mesa Black-on-white		1		1	
Socorro Black-on-white	1			1	
Unidentified Black-on-white	4	3	7	14	.4

Ceramic Wares	Jars	Bowls	Other	Totals	
				N	%
Cibola White Ware, mineral paint	22	10		32	.9
White ware, slipped and polished	75	34	2	111	3.0
Indented white ware, Group I	94			94	2.6
Indented white ware, Group II	72			72	2.0
Indented white ware, Group III	48			48	1.3
St. Johns Black-on-red		2		2	
Puerco Black-on-red		12		12	.3
Wingate Black-on-red		8		8	.2
White Mountain Red Ware		31		31	.8
Totals	2849	815	13	3677	99.4

Table 62. Ground stone artifact distribution, LA 6076

Provenience and Artifact Type	Fill		Floor Association		Subfloor	
	N	%	N	%	N	%
PIT STRUCTURES: Feature 28 Two-hand mano	1	1.0				
Rubbing stone	3	2.9				
Lapstone	1	1.0				
Polishing stone	3	3.9				
Worked slab	1	1.0				
Hoe			1	1.0		
Stone pendant	1	1.0				
Feature total	10	9.7	1	1.0		
Feature 59 Two-hand mano			2	1.9		
Worked slab	1	1.0				
Palette			1	1.0		
Metate			1	1.0		
Miscellaneous	1	1.0				
Feature total	2	1.9	4	3.9		
ROOMS: Feature 29 Two-hand mano	9	8.7	1	1.0	1	1.0

Provenience and Artifact Type	Fill		Floor Association		Subfloor	
	N	%	N	%	N	%
Metate	1	1.0				
Lapstone	1	1.0				
Palette			2	1.9		
Worked slab	2	1.9				
Grooved abrading stone					1	1.0
Polishing stone	1	1.0				
Feature total	14	13.6	3	2.9	2	1.9
Feature 31 Two-hand mano	1	1.0				
Rubbing stone	5	4.9				
Metate	1	1.0				
Mortar	1	1.0				
Hoe	1	1.0				
Worked slab	1	1.0				
Feature total	10	9.7				
Feature 34 Miscellaneous	1	1.0				
Feature 35 Two-hand mano	1	1.0				
Lapstone	2	1.9				
Grooved abrading stone	1	1.0				
Worked slab			2	1.9		
Polishing stone			2	1.9		
Feature total	4	3.9	4	3.9		
Feature 43 Two-hand mano	1	1.0				
Polishing stone			1	1.0		
Worked slab			1	1.0	1	1.0
Miscellaneous	1	1.0				
Feature total	2	1.9	2	1.9	1	1.0
Feature 57 Worked slab	2	1.9				
Feature 58 Worked slab	1	1.0			2	1.9
Feature 60 Two-hand mano	1	1.0	1	1.0		

Provenience and Artifact Type	Fill		Floor Association		Subfloor	
	N	%	N	%	N	%
Polishing stone	1	1.0				
Worked slab	4	3.9	1	1.9		
Miscellaneous	1	1.0				
Feature total	7	6.8	2	1.9		
GENERAL SITE: One-hand mano	3	2.9				
Two-hand mano	6	5.8				
Lapstone	2	1.9				
Rubbing stone	3	2.9				
Hoe	1	1.0				
Grooved abrading stone	1	1.0				
Polishing stone	2	1.9				
Worked slab	8	7.8				
Miscellaneous	3	2.9				
General site total	29	28.2				
SITE TOTAL	82	79.6	16	15.5	5	4.8

Table 63. Summary of faunal remains from LA 6076 (except for unique taxa, MNIs do not include surface materials)

Taxon (common name)	Specimens		MNI		Burning		Flotation			
							Specimens		Burning	
	N	%	Minimum	Maximum	Partial	Complete	N	%	Partial	Complete
Sylvilagus sp. (cottontail)	11	10.7	2	7			9	1.6		55.5
Lepus sp. (jackrabbit)	22	21.3	2	9	9.1		31	5.6		93.5
Small sciurid	1	1.0	1	1						
Large sciurid	1	1.0	1	1			10	1.8		30.0
Thomomys bottae (pocket gopher)	4	3.9	3	4			4	.7		
Perognathus sp. (pocket mouse)							1	.2		
Dipodomys ordii (kangaroo rat)							5	.9		
Cricetidae							6	1.1		
Peromyscus sp.							1	.2		
Neotoma sp. (woodrat)							1	.2		
Microtis sp. (microtine rodents)							1	.2		
Small rodent	1	1.0		1			27	4.9		11.1
Medium-large rodent							17	3.1	5.9	35.3
Rodent							29	5.3		17.2
Canis sp. (canids)	1	1.0		1		100.0				
Canis latrans (coyote)	4	3.9	1	4		75.0				
Taxidea taxus (badger)	1	1.0	1	1		100.0				
Felidae (large feline)	1	1.0	1	1						
Carnivore	1	1.0		1			4	.7		25.0
Odocoileus hemionus (mule deer)	T									
O. virginianus (white-tailed deer)	3	2.9	1	2						
Ovis/Capra (domestic sheep/goat)	1	1.0	1	1						
Bos taurus (cow)	1	1.0	1	1						
Callipepla squamata (quail)	1	1.0	1	1						
Meleagris gallopavo (turkey)	1	1.0	1	1			2	.4	50.0	
Small bird	2	1.9	1	1			8	1.4		12.5
Medium bird							2	.4		50.0
Large bird	2	1.9		2		50.0				
Phyrosoma sp. (horned lizard)							1	.2		
Herp (reptile or amphibian)							2	.4		
Small mammal	5	4.8		1		40.0	268	48.8	.7	86.2

Taxon (common name)	Specimens		MNI		Burning		Flotation			
							Specimens		Burning	
Small mammal (large bird)	5	4.8				100.0	6	1.1	16.7	
Small-medium mammal	5	4.8			20.0	20.0	17	3.1		58.8
Medium mammal	4	3.9		1		25.0	2	.4		100.0
Medium mammal (large bird)	3	2.9		1		20.0				
Medium-large mammal	11	10.7		1		18.2	5	.9		100.0
Large mammal	4	3.9		3		50.0	2	.4	50.0	50.0
Artiodactyl	4	3.9		1						
Unknown							6	1.1		
Unknown small	3	2.9					82	14.9		8.5
Totals	103	100.1	18	48			549	100.0		
Egg shell	4						27			
Burned	23	22.3					316	56.3		
Weathered	37	35.9					4	.7		

T = in the tool assemblage

Table 64. Faunal remains from the structures, LA 6076

Taxon	Feature 28			Feature 29				F. 34	Feature 35	
	Fill	F. 37*	Floor Association	Fill	Floor Association	Floor Fill/ Posthole*	Hearth/ Ash Pit *	Fill*	Fill	Floor Fill, Hearth*
Sylvilagus sp.	2			2				1		
Lepus sp.	2			6		1	21			
Large sciurid			2			2				1
Thomomys bottae	1		1			3				
Perognathus sp.		1								
Dipodomys ordii							4	1		
Peromyscus sp.						1				
Cricetidae			2			4				
Neotoma sp.						1				
Microtis sp.										
Small rodent			1			2	7			1
Medium-large rodent			7				3			
Rodent						15	3	1		
Canis latrans	1									
Felidae									1	
Taxidea taxus										
Carnivore				1						
O. virginianus	1				2					

Taxon	Feature 28			Feature 29				F. 34	Feature 35	
	Fill	F. 37*	Floor Association	Fill	Floor Association	Floor Fill/ Posthole*	Hearth/ Ash Pit *	Fill*	Fill	Floor Fill, Hearth*
Callipepla squamata										
Meleagris gallopavo										
Small bird	1					1				1
Medium bird										
Phyrosoma sp.						1				
Herp						2				
Small mammal				1	1	4	96	2		
Small mammal or large bird			3		2					
Small-medium mammal			3	1						
Medium mammal										
Medium mammal or large bird										
Medium-large mammal	2									
Large mammal										
Artiodactyl	1									
Unknown			6							
Unknown small		2	2			27	7	5		
Totals	11	3	27	11	5	64	141	10	1	3
Egg shell		1	3	3		7	3		1	
% Burned	18.2		14.8	9.1	60.0	1.6	89.4	20.0		
% Weathered	18.2			63.6	40.0		.7			

* = flotation sample

Table 64 (continued)

Taxon	F.41	Feature 57		Feature 58			F. 43 pit		Feature 59				Feature 60		
	All	All	Feat*	Fill	Floor	Pit*	Fill	0	Fill	Floor Assoc- iation	Floor Fill*	Feat*	Floor Fill	Floor Fill Pits*	Hearth ash pit*
Sylvilagus sp.		2		2	1	1	1	1						1	4
Lepus sp.	2			1			1		1	4				3	6
Large sciurid								1					1	4	
Thomomys bottae									2						
Perognathus sp.															
Dipodomys ordii															
Peromyscus sp.															
Cricetidae															
Neotoma sp.															
Microtis sp.														1	

Small rodent			2			2		8		1		2#		2	
Medium-large rodent											2	3		1	1
Rodent			2											2	6
Canis latrans		1							1						
Felidae															
Taxidea taxus	1														
Carnivore															4
O. virginianus															
C. squamata					1										
M. gallopavo									1		2				
Small bird					1	5									1
Medium bird														1	1
Phyrosoma sp.															
Herp															
Small mammal						9					15	17		24	100
Small mammal or large bird									1		3				
Small-medium mammal									3	1					14
Medium mammal									1		1		1		1
Medium mammal or large bird													1		
Medium-large mammal				3	2										5
Large mammal				2										1	1
Artiodactyl	1														
Unknown															
Unknown small						10		5		3	8	1		15	
Totals	4	3	4	8	5	27	2	15	10	9	31	23	3	55	144
Egg shell	1		2			8					1			1	3
% Burned	25	33		12		87	100		20	11	16	74		29	96
% Weathered	75			87					20	22	3		33	4	

* = flotation sample; # = partial skeleton

Table 65. Faunal counts for grids, trash units, and miscellaneous proveniences, LA 6076

Taxon	Surface	Check Dam Area	NE Site Area	Feature 59 Area (Trash)			Feature 61 Flotation
				0-30 cm	30-60 cm	60-140 cm	
Sylvilagus sp.				1			1
Lepus sp.	1		1			2	
Small sciurid					1		
Thomomys bottae					1		
Canis sp.				1			
Canis latrans			1				
Ovis/Capra		1					
Bos taurus	1*						
Large bird		1		1			
Small mammal				3			1
Small mammal or large bird		2					
Medium mammal		2					
Medium mammal/large bird			1	1			
Medium-large mammal			1	2	1		
Large mammal				1	1		
Artiodactyl		1				1	
Totals	3	7	4	10	4	3	2
% Burned		57.1	25.0	50.0	25.0		
% Weathered	33.3	28.6	25.0	30.0	25.0		

* = horn sheath

Table 66. Test trench and strip zone information, LA 14858

Feature Number	Dimensions (m)		Maximum Depth (cm)	Comments
	North-South	East-West		
1 (A-I)	8.5	1.0	45	fill: hard with rock and grass; sterile at 20 to 45 cm; deepest to the south
2 (A-I)	8.5	1.0	45	fill: same as Feature 1; sterile at 30 cm
3 (A-I)	8.5	1.0	15	no observations were made
4	9.0	1.0	60	fill: hard, sterile water-laid clays and silts; sterile at 60 cm in south, 30 cm in north; Feature 4 is within this feature
5	4.0	1.0	60	fill: same as Feature 4; Feature 6 is within this trench
10	1.5	?	45	fill: forest humus; upslope from rooms
12	?	?	30	fill: rocky hard clay and laminated silts; sterile at 30 cm?; downslope of rooms
13	?	?	60	fill: top: grass, rock, silty soil; center: rock, clays, silts, roots, cultural material; bottom: sterile off-white semiconsolidated tuff, south of rooms
17	1.0	6.0	45	no observations
18	1.0	6.0	?	no observations
19	.5	7.6	22	fill: rock, sandy silty soil with forest humus cover
20 east	.5	3.5	30	fill: forest humus over tuff
20 west	?	?	160	sterile was not reached
21	7.2	.5	15	fill: rocky, sandy silt and forest humus over tuff
22	1.0	1.0	200	fill: laminated silts and sands; organic at 200 cm; at west end of right-of-way
24	3.3	.5	65	fill: forest humus
25	1.5	.5	200	fill: forest humus
26	3.5	.5	75	fill: forest humus

Table 67. Structure dimensions, LA 14858 (m)

Feature	North	South	East	West	Area (sq m)
6	2.48	2.31	1.65	1.22	3.44
7	1.69	1.94	1.49	1.57	2.78
8**	2.41	2.32	2.47	2.49	5.86
9A	1.31		1.70		2.23
9B	2.50		3.20		8.00
11*	2.20		2.50		5.50
14	2.30	2.28	1.25	1.53	2.99
15	2,78		3.95		10.98
16*	2.40	1.90	3.40	3.60	7.52+
23	2.74		1.22+		3.34+

* estimated from bipod photos
** bipod photos suggest 2.60 x 2.60 m

Table 68. Posthole dimensions, Features 15 and 16, LA 14858 (cm)

Feature	N	Minimum	Maximum	Mean	SD
Feature 15 North	9	10.0	28.0	17.8	5.5
South	9	9.0	22.0	13.5	4.2
East	12	7.0	24.0	15.2	4.5
West	7	10.0	22.0	16.9	6.4
F. 8, 12-14	4	11.0	15.0	13.2	2.1
Feature 16 North	21	5.5	19.0	11.7	3.9
South	30	7.0	31.0	14.3	6.0
East	12	7.0	23.0	14.6	3.8
Southeast interior	13	5.0	10.0	6.8	1.7
Other interior	7	5.0	20.0	11.7	5.1

Table 69. Worked sherds from LA 14858

Provenience	Artifact	Ceramic Type	Comments
Back dirt	scraper?	Cebolleta Black-on-white	minimal grinding on one edge; 3.7 x 2.9 cm
Grid 1A stripping	scraper?	white ware	possible grinding and slight wear on one edge; 9.1 x 8.0 cm
Feature 6: 0-15 cm	drilled	Reserve Black-on-white	seed jar rim sherd with mend hole; drilled from the exterior
0-15 cm	drilled	Tularosa Patterned Corrugated, smudged	bowl rim; 2 mend holes; one each drilled from the interior and exterior; 6.0 x 5.9 cm
15 cm, floor	scraper	white ware	ground edges; bevel to exterior; broken; 7.1 x 8.8 cm
15 cm, floor	scraper	Reserve Black-on-white	square with rounded edges; all ground; bevel to interior; 4.4 x 4.1 cm
15 cm, floor	drilled	Tularosa Patterned Corrugated, smudged	one mend hole drilled from exterior; does not go all the way through; 2.9 x 2.4 cm
Feature 8: 0-15 cm	scraper?	Reserve Plain Corrugated	piece of a larger worked sherd; 1 ground edge; 2.5 x 3.9 cm
Feature 13: 0-30 cm	scraper	Reserve Plain Corrugated, smudged	one roughly ground edge with wear grooves perpendicular to the ground edge; 4.2 x 2.8 cm
Feature 20: 0-75 cm	drilled	St. Johns Black-on-red	bowl rim sherd drilled from interior and exterior; 4.4 x 3.7 cm

Table 70. Ceramic distribution, test trench (Features 1-3, 17, 20, 21, 22, 24, 25) and strip zone (Features 10, 12, 13), LA 14858

	Features 1-3											Feature 17				Feat. 20 E			Feature 20 W			
	0-15 cm				15-30 cm				30-45 cm			0-45 cm				0-30 cm			0-75 cm			
	J	B	U	T	J	B	U	T	J	B	T	J	B	O	T	J	B	T	J	B	U	T
Alma Plain		2		2																		
Alma Punched	1			1	4			4	2		2											
Brown Ware body	24			24	5		1	6	3		3	1			1	9		9	1			1
Brown Ware body, smudged		5	1	6	1		1	2														
Reserve: Black-on-white	2	1		3																		
Incised Corrugated																1		1				
Indented Corrugated	34			34	27			27	1		1	2			2	2		2	3			3
Indented Corrugated, smudged		49		49		17		17		1	1									6		6
Corrugated, neck-banded	1			1	2			2														
Plain Corrugated	13	1	7	21	3	14		17								1		1	1		4	5
Plain Corrugated, smudged	18	18		36	8	11		19	6		6									4		4
Plain Corrugated, Tularosa variety		1		1		1		1														
Smudged		3		3		4		4					3		3							
Tularosa: Black-on-white	9	2		11																		
Black-on-white glaze	8			8	1			1											1			1
Filet Rm																				1		1
Patterned Corrugated		7	2	9		8		8												1		1
Patterned Corrugated, smudged	1	10		11		3		3									1	1		3		3
Mimbres Corrugated					11			11														
Roosevelt Black-on-white					1*			1														
Cebolleta Black-on-white	1			1																		
Puerco Black-on-white	2			2															1			1
White ware, unslipped														1	1							
White ware, slipped and polished	2			2					1		1								1			1

	Features 1-3											Feature 17				Feat. 20 E			Feature 20 W			
	0-15 cm				15-30 cm				30-45 cm			0-45 cm				0-30 cm			0-75 cm			
	J	B	U	T	J	B	U	T	J	B	T	J	B	O	T	J	B	T	J	B	U	T
St. Johns Black-on-red		2		2																5		5
Total	116	101	10	227	63	58	2	123	13	1	14	3	3	1	7	13	1	14	8	20	4	32

Table 70 (continued)

	Feat. 21			F. 22	F. 24		F. 25	F. 10		Feature 12				Feature 13			
	0-15 cm			110 cm	0-45 cm		0-200 cm	0-15 cm		0-30 cm				0-60 cm			
	J	B	T	B	J	B	B	J	B	J	B	U	T	J	B	U	T
Alma Plain										1			1	1			1
San Francisco Red											1		1				
Brown Ware body								1		7	1		8	4			4
Brown Ware body, smudged										1			1	1			1
Reserve: Black-on-white				1		1									1		1
Incised Corrugated										2			2				
Indented Corrugated	4		4					1		5			5	21			21
Indented Corrugated, smudged		3	3				1				15		15		15		15
Corrugated, neck-banded										5			5				
Plain Corrugated	6		6							15			15	13	2	3	18
Plain Corrugated, smudged		1	1						3						17		17
Smudged				1							2		2				
Tularosa: Black-on-white					1	1				6			6	3	3		6
Black-on-white glaze										1			1				
Filet Rim															1		1
Patterned Corrugated												1	1		2		2
Patterned corrugated, smudged		1	1						2		3		3		3		3
Mimbres Corrugated												1					1
Mimbres Black-on-white											3		3				1
Kiatuthlanna Black-on-white														1			1
Puerco Black-on-white								1						1			1
White ware, unslipped										1			1	2			2

	Feat. 21			F. 22	F. 24		F. 25	F. 10		Feature 12				Feature 13			
	0-15 cm			110 cm	0-45 cm		0-200 cm	0-15 cm		0-30 cm				0-60 cm			
	J	B	T	B	J	B	B	J	B	J	B	U	T	J	B	U	T
White ware, slipped and polished										1	1		2				
Indented white ware, Group II														3			3
St. Johns Black-on-red											1		1		6		6
Total	10	5	15	2	1	2	1	3	5	45	27	1	73	51	50	3	104

* canteen

Table 71. Ceramic distribution, Feature 6, LA 14858

Ceramic Ware	0-15 cm		Fill		Floor Fill		Features		Room Totals		
	Jar	Bowl	Jar	Bowl	Jar	Bowl	Jar	Bowl	Jar	Bowl	Total
Reserve: Black-on-white	1		1						2		2
Indented Corrugated	19		4				4		27		27
Indented Corrugated, smudged		2		4		1				7	7
Plain Corrugated	1		7						8		8
Plain Corrugated, smudged		14	2	10		1		7	2	32	34
Plain Corrugated, Tularosa variety				1						1	1
Tularosa: Black-on-white			2				1		3		3
Black-on-white glaze			1						1		1
Patterned Corrugated		5		3						8	8
Patterned Corrugated, smudged		1		2						3	3
Mimbres Corrugated	1		1		4		1		7		7
White ware slipped and polished	2		3						5		5
St. Johns Black-on-red								1		1	1
Totals	24	22	21	20	4	2	6	8	55	52	107

Table 72. Ceramic distribution, Feature 8, LA 14858

Ceramic Wares	0-15 cm			Floor Fill			Floor			Room Totals				
	J	B	U	J	B	U	J	B	L	J	B	U	L	T
Alma Plain		1									1			1
Brown ware body	1									1				1
Brown ware body, smudged		1									1			1
Reserve: Black-on-white							1			1				1
Incised Corrugated	1									1				1
Indented Corrugated	8			2			1			11				11
Indented Corrugated, smudged		9			2			4			15			15
Plain Corrugated	5		2	30		1	1			36		3		39
Plain Corrugated, smudged		8			4			1			13			13
Smudged		2									2			2
Tularosa: Black-on-white	11									11				11
Patterned Corrugated	1							1		1	1			2
Patterned Corrugated, smudged		3		1	11			6		1	20			21
Puerco Black-on-white	1									1				1
White ware slipped and polished									1				1	1
St. Johns Black-on-red		1									1			1
Totals	28	25	2	33	17	1	3	12	1	64	54	3	1	122

J = jar; B = bowl; U = unknown; L = ladle

Table 73. Ceramic distribution, Feature 7, LA 14858

Ceramic Wares	0-15 cm		Fill		Floor		Room Totals		
	Jar	Bowl	Jar	Bowl	Jar	Bowl	Jar	Bowl	Total
Brown ware body			3				3		3
Reserve: Indented Corrugated	4	4	1				5	4	9
Indented Corrugated, smudged		6		5		1		12	12
Plain Corrugated	1		2				3		3
Plain Corrugated, smudged		1		3				4	4
Smudged				1				1	1
Tularosa: Black-on-white			1				1		1
Patterned Corrugated		1						1	1
Patterned Corrugated, smudged		2	1				1	2	3
Puerco Black-on-white					1		1		1
St. Johns Black-on-red		2						2	2
Wingate Black-on-red						5		5	5
Totals	5	16	8	9	1	6	14	31	45

Table 74. Ceramic distribution, Features 9A, 9B, and 14, LA 14858

	Features 9A and 9B									Feature 11						Feature 14					
	0-60 cm			Floor		Total				0-30 cm		Floor	Room Total			Fill		Floor Fill	Room Total		
	J	B	U	B	U	J	B	U	T	J	B	B	J	B	T	J	B	B	J	B	T
Brown ware body	12					12			12	2			2		2						
Brown ware body, smudged	7			1#		7	1		8								2			2	2
Reserve: Black-on-white	5					5			5	1			1		1						
Incised Corrugated	1					1			1												
Indented Corrugated	2					2			2	3			3		3	5			5		5
Indented Corrugated, smudged		10					10		10	3	7	2	3	9	12		3			3	3
Plain Corrugated											2			2	2	2			2		2
Plain Corrugated, smudged	2					2			2	1	5		1	5	6		2			2	2
Tularosa: Black-on-white	6		9			6		9	15	1			1		1	1			1		1
Patterned Corrugated											1			1	1						
Patterned Corrugated, smudged											3			3	3		2			2	2
Mimbres Black-on-white		1					1		1												
Mimbres Corrugated										2			2		2						
Cebolleta Black-on-white					1*			1	1												
Puerco Black-on-white	1					1			1	6			6		6						
Red Mesa Black-on-white	4					4			4												
White ware, unslipped	2					2			2												
White ware, slipped and polished	4					4			4							1			1		1
St. Johns Black-on-red											2			2	2			1		1	1
Totals	46	11	9	1	1	46	12	10	68	19	20	2	19	22	41	9	9	1	9	10	19

Feature 9, under slab on floor
* Feature 9B, ash pit

Table 75. Ceramic distribution, Features 15 (jacal room) and 16 (pit structure), LA 14858

Ceramic Ware	Feature 15									Feature 16								
	0 - 60 cm			Floor Fill		Room Totals				Fill		Floor Fill		Floor		Room Totals		
	J	B	U	J	B	J	B	U	T	J	B	J	B	J	B	J	B	T
Alma Plain										4	1					4	1	5
Brown Ware body	1					1			1	49		2		3		54		54
Brown Ware body, smudged														2		2		2
Reserve: Black-on-white										5			1		1	5	2	7
Incised Corrugated										22		2				24		24
Indented Corrugated	9			1		10			10									
Indented Corrugated, smudged		7			2		9		9		2						2	2
Plain Corrugated	4		2	3		7		2	9									
Plain Corrugated, smudged		5			7		12		12		1						1	1
Punched Corrugated										1				2		3		3
Smudged		3					3		3				1		8		9	9
Tularosa: Black-on-white	2	3*		1	1	3	4		7	1	1					1	1	2
Patterned Corrugated		2					2		2		1						1	1
Patterned Corrugated, smudged		4			2		6		6									
Puerco Black-on-white		1					1		1									
White ware, unslipped										3	1			1		4	1	5
White ware, slipped and polished										1					1	1	1	2
St. Johns Black-on-red		7					7		7									
Totals	16	32	2	5	12	21	44	2	67	86	7	4	2	8	10	98	19	117

J = jar; B = bowl; U = unknown form; T = total

Table 76. Summary of ceramics, LA 14858

Ceramic Wares	Jar	Bowl	Ladle	Unknown	Totals	
					N	%
Alma Plain	6	4			10	.8
Alma Punched	7				7	.6
San Francisco Red		1			1	.1
Brown ware body	128	1		1	130	10.7
Brown ware body, smudged	12	9		2	23	1.9
Reserve: Black-on-white	16	6			22	1.8
Incised Corrugated	29				29	2.4
Indented Corrugated	163	4			167	13.8
Indented Corrugated, smudged	3	174			177	14.6
Corrugated Neck-banded	8				8	.7
Plain Corrugated	108	19		19	146	12.1
Plain Corrugated, smudged	37	123			160	13.2
Plain Corrugated Tularosa variety		3			3	.2
Punched Corrugated	3				3	.2
Smudged		28			28	2.3
Tularosa: Black-on-white	46	11		9	66	5.5
Black-on-white glaze	12				12	1.0
Filet rim		2			2	.2
Patterned Corrugated	1	32		3	36	3.0
Patterned Corrugated, smudged	3	62			65	5.4
Mimbres Black-on-white		4			4	.3
Mimbres Corrugated	21				21	1.7
Roosevelt Black-on-white	1				1	.1
Cebolleta Black-on-white	1			1	2	.2
Kiatuthlanna Black-on-white	1				1	.1
Puerco Black-on-white	4				4	.3
Red Mesa Black-on-white	14	1			15	1.2
White ware, unslipped	9	1	1		11	.9

White ware, slipped and polished	16	2	1		19	1.6
Indented white ware, Group II	3				3	.2
St. Johns Black-on-red		28			28	2.3
Wingate Black-on-red		5			5	.4
Totals	652	520	2	35	1209	99.9

Table 77. Ground stone artifact distribution, LA 14858

Provenience/ Tool Type	Fill		Floor Fill		Floor Contact	
	N	%	N	%	N	%
General Site: One-hand mano	1	2.3				
Two-hand mano	4	9.1				
Rubbing stone	3	6.8				
Lapstone	2	4.5				
Polishing stone	1	2.3				
Maul*	1*	2.3				
General site total	12	27.3				
Feature 6: Two-hand mano	2	4.5				
Rubbing stone	1	2.3				
Axe			1	2.3		
Feature total	3	6.8	1	2.3		
Feature 7: Two-hand mano	1	2.3				
Maul*					1*	
Feature total	1	2.3				
Feature 8: Rubbing stone	1	2.3				
Metate	1	2.3				
Worked slab	5	11.4	1	2.3		
Maul*					1*	
Feature total	7	16.0	1	2.3		
Feature 9B: Two-hand mano					2	4.5

Provenience/ Tool Type	Fill		Floor Fill		Floor Contact	
	N	%	N	%	N	%
Rubbing stone	1	2.3				
Lapstone	1	2.3			1	2.3
Worked slab					1	2.3
Feature total	2	4.5			4	9.1
Feature 11: Two-hand mano	2	4.5				
Polishing stone	1	2.3				
Feature total	3	6.8				
Feature 15: Two-hand mano	2	4.5				
Worked slab	1	2.3				
Feature total	3	6.8				
Feature 16: Two-hand mano	1	2.3	2	4.5	1	2.3
Lapstone	1	2.3				
Metate					1	2.3
Worked slab	1	2.3				
Feature total	3	6.9	2	4.5	2	4.5
Site Totals	34	77.3	4	9.1	6	13.6

* fragments of the same maul counted as one artifact

Table 78. Summary of faunal remains from LA 14858

Taxon	Miscellaneous Grids and F. 31	Feature 6			F. 7	F. 8	F. 9	F.10	F.11	F.13	F.15	F.16	Totals				MNI	
		Floor Fill/Floor	Hearth		Floor	Floor Fill	Floor	Fill	Fill	Fill	Hearth	Floor Fill	Regular		Flotation		Minimum	Maximum
			R	F							F		N	%	N	%		
Sylvilagus sp.	5	20		8	1						1	2	28	50.0	9	12.9	4	9
Lepus sp.	1									1			2	3.6			1	2
C. gunnisoni	1	1											2	3.6			2	2
Large sciurid						3	1		5		2		9	16.1	2	2.9		4
Thomomys bottae						1				1			2	3.6			1	2
Microtis sp.		1											1	1.8			1	1
Large rodent			1										1	1.8				1
Odocoileus hemionus										2			2	3.6			1	1
cf. *Ovis canadensis*								1					1	1.8	59	84.3	1	1
Small mammal	1		2	59									3	5.4				
Medium-large mammal										1			1	1.8				
Large mammal	1	1											2	3.6				1
Artiodactyl									1				1	1.8				1
Large artiodactyl		1											1	1.8				1
Total	9	24	3	67	1	4	1	1	6	5	3	2	56	100.3	70	100.1	11	26
% Burned	11.1	8.3	66.7	97.0							33.3		6	10.7	66	94.3		
% Weathered	66.7	91.6				100	100	100	50.0	60.0		50.0	41	73.2				

R = regular; F = flotation

Table 79. Burning, LA 14858

Taxon	% Regular Bone	% of Flotation Bone
Sylvilagus sp.	7.1	77.8
Lepus sp.	50.0	
Small mammal	66.7	100.0
Large mammal	50.0	

Table 80. Ceramic distribution, LA 14882

	Surface		Feat. 2		Feat. 3			Feature 4					Feat. 5		Feat. 7		Feat. 8		Total				
			5.7-6.7 m		5-7 m		0-2 m	0-5.5 m			6.5-8.5 m		0-25 cm		0-50 cm		0-60 cm						
			10-50 cm		0-50 cm		15-20 cm	0-80 cm			5-40 cm												
	J	B	J	B	J	B	J	J	B	U	J	B	J	B	J	B	J	B	J	B	U	T	%
Alma Plain		1							1											2		2	.9
Brown ware body					2					1	2				6				10		1	11	5.2
Brown ware body, smudged						13			13							15		1		42		42	19.8
Reserve: Black-on-white	2				1		1	1						2					5	2		7	3.3
Indented Corrugated	2				9		1	7					1		4		1		25			25	11.8
Indented Corrugated, smudged						3						1		1		2				7		7	3.3
Plain Corrugated	4		1		29			4					1		4		7		50			50	23.6
Plain Corrugated, smudged						7			5					2		2				16		16	7.5
Punched Corrugated					3			2							4		1		10			10	4.7
Smudged				1		5			2							4		3		15		15	7.1
Tularosa Patterned Corrugated	2				2		1	1							1				7			7	3.3
Puerco Black-on-white					2	1		4							1	1			7	2		9	4.2
Cibola White Ware								3			1					4			4	4		8	3.8
St. Johns Black-on-red																	1		1			1	.5
White Mountain Redware															1		1		2			2	.9
Total	10	1	1	1	48	29	3	22	21	1	3	1	2	5	21	28	11	4	121	90	1	212	99.9

Table 81. Excavation unit information, LA 14906

Strip Feature	Grids Excavated	Depth (cm)	Comments
1			surface collection only
2			surface collection only
3	12 - 28 N	5 - 10	
4	10 - 30 N	10	
5	10 - 30 N	5 - 15	Features: fire pit (F. 47)
6	16 - 30 N	5 - 15	Features: use surface (F. 38), fire pits (F. 41, 42, 43, 44, 49, 50)
7	16 - 31 N	10 - 15	Features: use surface (F. 38), fire pits (F. 37, 45, 46)
8	16 - 32 N	5 - 15	Features: fire pits (F. 39, 40, 51)
9	18 - 32 N	10 - 15	Features: fire pit (F. 30)
10	6 - 18 N	10	Features: fire pit (F. 48)
11	6 - 32 N	10 - 15	
12	22 - 30 N	10 - 15	Features: use surfaces (F. 31, 32)
13	10 - 18 N	5 - 10	Features: use surfaces (F. 31, 32); posthole?
14	12 - 33 N	5 - 15	Features: use surface (F. 31)
15	6 - 18 N	5	Features: use surface (F. 31)
16	8 - 20 N	5 - 15	
17	10 - 22 N	5 - 15	
18	8 - 20 N	5 - 15	Features: use surface (F. 35); fire pit (F. 36); undescribed feature (F. 33)
19	14 - 20 N	5 - 15	Features: use surface (F. 35); fire pits (F. 26, 34)
20			surface collection only
21			surface collection only
100		10 - 20	20 cm in SW quad
102		10 - 20	20 cm in SW quad
103		10 - 20	20 cm in SW quad
104		10 - 20	20 cm in SW quad
105		10 - 20	20 cm in SW quad
106		10	fire-cracked rock pile and stain

Note: The feature forms do not give the grids excavated or depths; these were taken from the FS sheets and field notes and may not include grids with no artifact recovery.

Table 82. Summary of fire pits, LA 14906

Feature	Location	Diameter (cm)	Depth (cm)	Comments
26	F. 19, 12.5 N	30	13	fill: charcoal with little ash; circular; fired dark brown
27	F. 28, 18.0 N	40	8	fill: brown sandy silt
30	F. 29, 17.3 N	50 x 35	11	fill: organic and charcoal stained; no rock; oval with sloping sides and round bottom; unprepared; sides burned
33				no information recorded
34	F. 19, 14.5 N	82 x 78	9	cobble lined, 2 stones deep; eroded
36	F. 18, 16.5 N	76 x 70	10	rock lined; deflated; 5-15 cm below surface
37	F. 7, 20.2 N	125 x 103	12	unlined; oval; shallow; bottom hard and heavily stained
39	F. 8, 29.0 N	42	7	shallow; 1 rock on bottom, 4 at edge; little charcoal staining
40	F. 8, 21.0 N?	100	12	oval; unlined; moderate charcoal stain; hard-packed clay or sterile bottom
41	F. 6, 20.5 N	25	10?	deflated; stain with fire-cracked rock; 25 cm below the surface
42	F. 6, 21.0 N	60 x 67	11	deflated; little charcoal staining; rock lined but not well defined
43	F. 6, 21.5 N	40 x 48	9	deflated; slight stain; 5 stones at edge; not clearly defined
44	F. 6, 21.7 N	45	6	deflated; slight stain; one rock at edge; hard clay bottom
45	F. 7, 19.5 N	40 x 43	13	round; no rock; bottom is hard clay; moderate charcoal stain; 5-10 cm below the surface
46	F. 7, 25.7 N	40 x 30	8	rock lined (8 to 10 rocks) sides and bottom; moderate charcoal stain
47	F. 5. 20.2 N	56	12	semioval; rock-lined bottom and sides; slight charcoal stain
48	F. 10, 17.2 N	54 x 44	10	oval; 4 rocks at edge; eroded; hard clay bottom; slight charcoal stain
49	F. 6, 23.7 N	55 x 47	7	oval; unlined; bottom of hard clay; moderate charcoal stain
50	F. 6, 27.0 N	63 x 48	13	oval; unlined; bottom of hard clay; moderate charcoal stain
51	F. 8, 18.0 N	40	25	round; no rock; moderate charcoal stain
no number	F. 106	45 x 30	7	deflated; 12 rocks
no number	F. 12, 29.5 N			no description; rock collected at 10 to 15 cm below the surface

Table 83. Ceramic distribution, LA 14906

Feature:	1-9			9-22	100-106		4-9		4-9		4-8	10-13	16-19			15-18	Totals		
Meters North:							26-30		20-26		16-20	10-22	14-22			8-12			
Depth:	Surface		0-15	Surface	0-5		0-10	10-30	0-10	10-15	0-10	10-15	0-5	5-10	10-15	0-5	N		%
Ware/Form:	J	B	J	J	J	B	J	B	J	J	J	J	J	J	J	J	J	B	T
Alma Plain*	2		1	1					1		2		2	1		1	11		4.8
San Francisco Red				3	2		1				3		11	4	4	22	50		21.6
Brown Ware	2		5	2	4	1	13	5	11	1	5	4	17	2	7	6	84	1	36.8
Brown Ware, smudged			1	2	1				1		1			1	3	2	12		5.2
Brown Ware, polished			7	5	5		3	3	8		6	2	8	2	3	17	69		29.9
Reserve: Black-on-white				1													1		.4
Plain Corrugated, smudged									1								1		.4
Smudged														1			1		.4
Unknown red-on-brown		1																1	.4
Totals	4	1	14	14	12	1	17	8	22	1	17	6	38	11	17	48	229	2	99.9

* rim sherds only

Table 84. Summary of fauna from LA 14906

Features:	Surface	4-8	4-8	4-9	10-13	16-19	105 106	Totals			
Meters north:		16-20	20-26	26-32	10-22	12-22		Specimens		MNIs	
Taxon/level (cm):		0-10	0-10	10-30	5-15	0-15		N	%	Minimum	Maximum
Sylvilagus sp.			1	2				3	7.7	2	2
Lepus sp.		2						2	5.1	1	1
Thomomys bottae				3	2	2		7	17.9	2	3
Neotoma sp.						3		3	7.7	1	1
Odocoileus sp.						1		1	2.5	1	1
Small mammal		1	1					2	5.1		
Small-medium mammal		2						2	5.1		
Medium-large mammal				1		5		6	15.4		1
Large mammal	1	4		1		2	4	12	30.8		3
Large artiodactyl	1							1	2.5	1	1
Totals	2	9	2	7	2	13	4	39	99.8	8	13
% Burned		11.1		14.3		7.7	25.0	4	10.2		
% Etched/eroded		44.4	100.0	14.3	100.0	23.1	50.0	14	35.9		
% Rounded/digested				28.6				2	5.1		

Table 85. Ceramic distribution, LA 14907

Ceramic Wares	Surface and Misc.	F. 20	Feature 23		Rest				Totals		
		0-35 cm	0-25 cm		0-10 cm		10-25 cm				
	Jar	Jar	Jar	Bowl	Jar	Bowl	Jar	Bowl	Jar	Bowl	%
Plain Brown ware	3	2	1		3				9		18.0
Plain Brown, smudged	5								5		10.0
Reserve: Black-on-white	1		1						2		4.0
Indented Corrugated	2	3	2		1				8		16.0
Indented Corrugated, neck-banded					1				1		2.0
Indented Corrugated, smudged				1		1				2	4.0

Ceramic Wares	Surface and Misc.	F. 20	Feature 23		Rest				Totals		
		0-35 cm	0-25 cm		0-10 cm		10-25 cm				
	Jar	Jar	Jar	Bowl	Jar	Bowl	Jar	Bowl	Jar	Bowl	%
Plain Corrugated			1		6		4		11		22.0
Plain Corrugated, smudged			1		5				6		12.0
Tularosa Black-on-white	1								1		2.0
St. Johns Black-on-red								1*		1	2.0
Wingate Black-on-red	3				1				4		8.0
Total	15	5	6	1	17	1	4	1	47	3	100.0

* worked sherd

Table 86. Summary of fauna from LA 14907

Taxon	N	%
Odocoileus virginianus (white-tailed deer)	1	20.0
Artiodactyl	1	20.0
Very large mammal or large artiodactyl	3	60.0
Totals	5	100.0
Burned	1	10.0
Weathered	4	80.0

Table 87. Summary of excavation units, LA 14908

Feature	Grids (m east)	Maximum Depth (cm)	Comments
1	0-10	15	screened
2	0-10	15-45	0-10 cm and south half 10-45 cm screened
3	0-10	5-10	screened
4	0-10	30-45	0-10 cm and south half 10-45 cm screened; charcoal at 20 cm
5	0-10	10-20	0-10 cm screened
6	0-16	10-40	0-10 cm and south half 10-45 cm screened; charcoal at 20 cm; possible wall alignments and 9 and 11 m east
7	0-16	0-45	

Feature	Grids (m east)	Maximum Depth (cm)	Comments
8	0-16	30-55	0-10 cm and south half 10-55 cm screened; scattered charcoal 5-50 cm
9			surface collection only
10	0-16	5-10	screened
11	0-16	20	0-10 cm screened; many sherds at 0-10 cm
12	0-16	5	screened
13	0-16	20	0-10 cm screened; many sherds
14	0-16	0-20	Grids 10 to 14 excavated
15	0-18	10-50	0-10 cm and Grids 12 to 16, 20 to 50 cm screened; maximum artifact concentration; very rocky fill with wall plaster and fire-cracked rock
16	0-18	10-50	0-5 cm screened; some fire-cracked rock and trash in 0-5 cm; possible wall fall
17-22			surface collection only
23	14-20	15-30	0-5 cm screened; 5-10 cm very hard clay
24	8-20	20-30	0-5 cm screened; possible wall alignments; Grids 8-12 disturbed
25	8-20	0-10	screened; Grids 8-12 disturbed
26	8-20	0-5	screened; Grids 8-12 disturbed
27	8-20		surface collection only; Grids 8-12 disturbed
28	8-20	0-20	0-10 cm screened; Grids 8-12 disturbed
29	8-20		surface collection only
30	14-20	0-10	Grids 17-18 disturbed; no cultural material
31	14-20	0-10	Grids 17-18 disturbed; no cultural material; possible rock alignment 18 to 20 m east, terrace or water-control feature

Table 88. Number of rim sherds by type and rim form, LA 14908

	Direct						Everted						Rounded		Tapered/ Rounded	Flat	Total No. of Forms	
Rim Shape:	Rounded		Tapered		Flat	Rounded/ Flat	Everted	Rounded	Tapered	Roll	Flat							
Ware/Form:	J	B	J	B	B	B	J	J	J	J	J	B	J	B	J	J	J	B
San Francisco Red	2		3														2	
Plain Brown Ware	2		3				10	10	1		1		2		1	1	9	
Plain Brown Ware, smudged				2														1
Reserve: Black-on-white							1										1	
Indented Corrugated	6																1	
Indented Corrugated, smudged		1		3														2
Plain Corrugated			4				1			1							3	
Plain Corrugated, smudged		1		1	1				1								1	3
Plain Corrugated, Tularosa variety				1														1
Smudged		2		2		1												3
Tularosa: Black-on-white		2	1	2	1												1	3
Patterned Corrugated	1						4		1								3	
Patterned Corrugated, smudged		1		2	2		1					1		1			1	5
Starkweather Black-on-white					2													1
Gray Ware				1											1		1	1
Total number of types	4	5	4	8	4	1	5	1	3	1	1	1	1	1	2	1	23	20

J = jar; B = bowl

Table 89. Surface-stripping ceramic distribution, LA 14908

Feature:	1-5		6-9					10-13			14-17		14-18		23	28
Meters east:			0-7			8-14		0-7		8-16	0-7		8-16			
Ceramic Ware/Form:	J	B	J	B	U	J	B	J	B	J	J	B	J	B	J	J
Alma Plain					1			1								
San Francisco Red	1		5			1		4		1			1			
Plain Brown ware	14		25			6		61		31	8		6			1
Plain Brown, smudged		1		3			1		1		1	5		5		
Reserve: Black-on-white											1	1				
Indented Corrugated	13		3			1		8		5	17		14			
Indented Corrugated, smudged		1							2			2	1	2		
Plain Corrugated	42		3			1		21		7	29		24		2	1
Plain Corrugated, smudged		1					1		4	1		6				
Smudged														1		
Tularosa: Black-on-white			3											3		
Patterned Corrugated	3		1					3			5		4			
Pat. Corrugated, smudged	1	6									1	1		4		
Socorro Black-on-white														1		
Cibola White Ware, plain			1													
Cibola White Ware, mineral paint	1		1								1		1			
Gray Ware		1	7			2		6		4						
White Mountain Red Ware		1		8				1*								
Totals	75	11	49	11	1	11	2	105	7	49	63	15	51	16	2	2

* unslipped

Table 90. Ceramic distribution, LA 14908 excavation

	Features 1-5		Features 6-9					Features 10-13				Feature 15		Features 14-16							Feature 23		F. 28
	5-20 E		0-7 E		8-15 E		8-15 E	1-7 E		8-12 E		0-8 E		0-8 E							13-19 E		12-14 E
	5-20 and 45* cm		5-30 cm		5-30 cm		30-55 cm	5-20 cm		5-20 cm		5-10 cm		5-20 cm		20-35 cm		35-60 cm			5-20 cm		5-10 cm
	J	B	J	B	J	B	J	J	B	J	B	J	B	J	B	J	B	J	B	L	J	B	B
Alma Plain	1						1							1									
Alma Textured																1							
San Francisco Red	1		1					9		3						1		3					
Brown ware	3		9		12		3	39		35		11		27		8		5					
Brown ware, smudged		3			2	1		1	4		3		3	3	11	4	13	1					
Reserve: Black-on-white		1						2		1			4	9	1	10	1	6		1			
Indented Corrugated	4		1					11	1	10		19		97		15	1	5			1		
Indented Corrugated, smudged									7		9			6	11	6	7	2	6				
Plain Corrugated	22		3					13		8		11		75		21		10					
Plain Corrugated, smudged		6						2						3	12	4	4		5				
Plain Corrugated, smudged, Tularosa variety															1								
Smudged															2		2						
Tularosa: Black-on-white		2								1		1			2	1	1	1	3				1
Patterned Corrugated	4				3			2		7		6		29		12		4					
Patterned Corrugated, smudged		1		1				2							3	1	1	6					
Starkweather, smudged decorated																	2		2				
Cibola White Ware, plain					1		1	2						7		5	1		1				
Cibola White Ware, mineral paint														11				1					
Cibola White Ware, carbon paint																		1					
Pueblo II, indented										2				12				1					

	Features 1-5		Features 6-9					Features 10-13				Feature 15		Features 14-16							Feature 23		F. 28
	5-20 E		0-7 E		8-15 E		8-15 E	1-7 E		8-12 E		0-8 E		0-8 E							13-19 E		12-14 E
	5-20 and 45* cm		5-30 cm		5-30 cm		30-55 cm	5-20 cm		5-20 cm		5-10 cm		5-20 cm		20-35 cm		35-60 cm			5-20 cm		5-10 cm
	J	B	J	B	J	B	J	J	B	J	B	J	B	J	B	J	B	J	B	L	J	B	B
Gray ware					1		2	4		3		1		4		3		1					
White Mountain Redware				1																			
Puerco Black-on-red																						1	
Total	35	13	14	2	19	1	7	87	12	70	12	49	7	284	43	92	33	47	17	1	1	1	1

* one sherd at 45 cm

Table 91. Summary of ceramics, LA 14908

Ceramic Ware	Jar	Bowl	Ladle	Unknown	Total	Percent
Alma Plain	4			1	5	.4
Alma Textured	1				1	.1
San Francisco Red	31				31	2.3
Plain Brown ware	304				304	23.1
Plain Brown ware, smudged	12	54			66	5.0
Reserve: Black-on-white	29	8	1		38	2.9
Indented Corrugated	224	2			226	17.1
Indented Corrugated, smudged	15	47			62	4.7
Plain Corrugated	293				293	22.2
Plain Corrugated, smudged	10	39			49	3.7
Plain Corrugated, smudged, Tularosa variety		1			1	.1
Smudged		5			5	.4
Tularosa: Black-on-white	7	12			19	1.4
Patterned Corrugated	83				83	6.3
Patterned Corrugated, smudged	11	17			28	2.1
Starkweather, smudged and decorated		4			4	.3
Socorro Black-on-white		1			1	.1
Cibola White Ware, plain	17	2			19	1.4
Cibola White Ware, mineral paint	16				16	1.2
Cibola White Ware, carbon paint	1				1	.1
Pueblo II Indented	15				15	1.1
Gray Ware	38	1			39	3.0
White Mountain Red Ware	1	10			11	.8
Puerco Black-on-red		1			1	.1
Totals	1112	204	1	1	1318	99.9

Table 92. Fauna summary, LA 14908

Taxon (Common Name)	N	Percent
Lepus sp. (jackrabbit)	3	27.3
Thomomys bottae (pocket gopher)	3	27.3
Buteo sp. (hawks)	1	9.1
Cf. small artiodactyl	1	9.1
Medium to large mammal	2	18.2
Large mammal	1	9.1
Totals	11	100.1
Burned	3	27.3
Weathered (etched)	4	36.4

Table 93. Nonstructure ceramic distribution, LA 14909

Features:	General Surface		1 - 3							4 - 6							1 - 3	
Meters East:			0 - 4							0 - 4							4 - 6	
Level (cm):			15-20		21-25		26-31			15*, 20-25			26-29**		30-37		15-20	
Ware/Form:	J	B	J	B	J	B	J	B	L	J	B	L	J	B	J	B	J	B
Brown Ware	4		2	1	80	2	8			48	2		11		2		14	10
Brown Ware, smudged				2		23		7			10		1	2	1			3
San Francisco Red																		
Reserve: Black-on-white					1	6	2			1	6			1	8	1	1	2
Incised Corrugated	1				5					4			1				6	
Indented Corrugated					15	1	2			3					3		4	
Indented Corrugated, neck-banded					3													
Indented Corrugated, rough-tooled	1																	
Indented Corrugated, smudged		1				1		4			1			1				2
Plain Corrugated	1		3		20	2				17			3		1		10	
Plain Corrugated, neck-banded	2		1		3					1								
Plain Corrugated, smudged						5		1			1			1				2
Punched Corrugated					7		1			2							2	
Punched Corrugated, neck-banded					2													
Smudged						19		2			2					2		4
Tularosa: Black-on-white						1			2			1	1	1				
Patterned Corrugated	1																1	
Patterned Corrugated, smudged																		
Mimbres Black-on-white						2												
Kiatuthlanna Black-on-white													2					
Puerco Black-on-white														1				
Gallup Black-on-white										1			1					

Features:	General Surface		1 - 3							4 - 6							1 - 3	
Meters East:			0 - 4							0 - 4							4 - 6	
Level (cm):			15-20		21-25		26-31			15*, 20-25			26-29**		30-37		15-20	
Ware/Form:	J	B	J	B	J	B	J	B	L	J	B	L	J	B	J	B	J	B
Unidentified Pueblo I black-on-white																		
Indented white ware, Group III					10					1							1	
White Ware		1						1		1			2		1			
Puerco Black-on-red						1												
Totals	10	2	6	3	146	63	13	15	2	79	22	1	22	7	16	3	39	23

* n = 2; ** includes Features 20, 21, and 22

Table 93 (continued)

Features:	1 - 3		4 - 6							1		Feature 17 (Work Area)					
Meters East:	4 - 6		4 - 6							7 - 11							
Level (cm):	21-25		18-20			21-25		26-29*		3-14		6-11		12-17		18-20*	
Ware/Form:	J	B	J	B	L	J	B	J	B	J	B	J	B	J	B	J	B
Brown Ware	10		2	5		9		6		2		13		14		5	
Brown Ware, smudged		4		4			3						1				4
San Francisco Red																1	
Reserve: Black-on-white		1	4	1			1	5					1@			2	3@
Incised Corrugated			1			4						1					
Indented Corrugated	2		2			1						1		3		1	
Indented Corrugated, neck-banded			1														
Indented Corrugated, rough-tooled												1				1	
Indented Corrugated, smudged							1		1		2						
Plain Corrugated			1			2		1		1		5		10		1	

Features:	1 - 3		4 - 6							1		Feature 17 (Work Area)					
Meters East:	4 - 6		4 - 6							7 - 11							
Level (cm):	21-25		18-20			21-25		26-29*		3-14		6-11		12-17		18-20*	
Ware/Form:	J	B	J	B	L	J	B	J	B	J	B	J	B	J	B	J	B
Plain Corrugated, neck-banded												2		1			
Plain Corrugated, smudged		1		1			1										
Punched Corrugated	1					1						2		4			
Punched Corrugated, neck-banded																	
Smudged		1		6			1								1		
Tularosa: Black-on-white		1		1													
Patterned Corrugated												7		1			
Patterned Corrugated, smudged													1		1		
Mimbres Black-on-white																	
Kiatuthlanna Black-on-white					1												
Puerco Black-on-white																	
Gallup Black-on-white																	
Unidentified Pueblo I black-on-white													5				
Indented white ware, Group III	1		1													1	
White Ware		1	2				2										
Puerco Black-on-red																	
Totals	14	9	14	18	1	17	9	12	1	3	2	32	8	33	2	12	7

* below the work surfaces @ sherds from the same bowl

Table 93 (continued)

Features:	Feature 7 (Work Area)					4 - 5							10		2 - 6	
Meters East:						6 - 8									11	
Level (cm):	6-10*		12-15	10-20		4-11			16-18		21-25		1-7		2-9	
Ware/Form:	J	B	J	J	B	J	B	L	J	B	J	B	J	B	J	B
Brown Ware	4	1	1	2		2			9		1		2	2	3	
Brown Ware, smudged		5					1			11				1		3
San Francisco Red																
Reserve: Black-on-white	1	3	1		3			1				3		1		
Incised Corrugated									5		1		1*			
Indented Corrugated	1		2						3		1		1			
Indented Corrugated, neck-banded													1			
Indented Corrugated, rough-tooled			2										1		2	
Indented Corrugated, smudged		1					1									1
Plain Corrugated			4	2					5				5		1	
Plain Corrugated, neck-banded																
Plain Corrugated, smudged		1										1				3
Punched Corrugated	1										1					
Punched Corrugated, neck-banded																
Smudged		3										1				1
Tularosa: Black-on-white																
Patterned Corrugated																
Patterned Corrugated, smudged																
Mimbres Black-on-white														1		
Kiatuthlanna Black-on-white																
Puerco Black-on-white																
Gallup Black-on-white										1						

Features:	Feature 7 (Work Area)					4 - 5							10		2 - 6	
Meters East:						6 - 8									11	
Level (cm):	6-10*		12-15	10-20		4-11			16-18		21-25		1-7		2-9	
Ware/Form:	J	B	J	J	B	J	B	L	J	B	J	B	J	B	J	B
Unidentified Pueblo I black-on-white																
Indented white ware, Group III	1															
White ware										1		1				
Puerco Black-on-red		1														
Totals	8	15	10	4	3	2	2	1	22	13	4	6	11	5	6	8

* above use-surface; @ neck-banded

Table 94. Ceramic distribution of structure, LA 14909

Feature:	8		9		8/9		15				16	
Levels:	Fill: 2-5		Fill: 3-6		Floor Fill or Floor		Fill: 2-9		Floor Fill		Fill: 4-8	
Ceramic Ware/Form:	Jar	Bowl	Jar	Bowl	Jar	Bowl	Jar	Ladle	Jar	Bowl	Jar	Bowl
Plain Brown Ware	12		3		2		3		1	1		3
Plain Brown Ware, smudged				24		1						1
Reserve: Black-on-white		7			1	1	3	2				2
Indented Corrugated	3		2		3							
Indented Corrugated, smudged		1				1						
Plain Corrugated	5				3		3		1			
Plain Corrugated, neck-banded	3											
Punched Corrugated					2							
Smudged				9								
Tularosa Patterned Corrugated	1				1							
Mimbres Black-on-white		1										
Red Mesa Black-on-white	1											
Gallup Black-on-white											1	
Indented white ware, Group III	18				1						1	
White Ware												1
Totals	43	9	5	33	13	3	9	2	2	1	2	7

Table 95. Summary of ceramics, LA 14909

Ceramic Ware	Jar	Bowl	Ladle	Total	Percent
Brown Ware body	275	27		302	33.0
Brown Ware body, smudged	2	110		112	12.2
San Francisco Red	1			1	.1
Reserve: Black-on-white	30	43	3	76	8.3

Ceramic Ware	Jar	Bowl	Ladle	Total	Percent
Incised Corrugated	30			30	3.3
Indented Corrugated	53	1		54	5.9
Indented Corrugated, neck-banded	5			5	.5
Indented Corrugated, rough-tooled	8			8	.9
Indented Corrugated, smudged		19		19	2.1
Plain Corrugated	105	2		107	11.7
Plain Corrugated, neck-banded	13			13	1.4
Plain Corrugated, smudged		18		18	2.0
Punched Corrugated	24			24	2.6
Punched Corrugated, neck-banded	2			2	.2
Smudged		52		52	5.7
Tularosa: Black-on-white	1	4	3	8	.9
Patterned Corrugated	12			12	1.3
Patterned Corrugated, smudged		4		4	.4
Mimbres Black-on-white		2		2	.2
Kiatuthlanna Black-on-white	2		1	3	.3
Red Mesa Black-on-white	1			1	.1
Puerco Black-on-white		1		1	.1
Gallup Black-on-white	3	1		4	.4
Pueblo I Black-on-white		5		5	.5
Indented white ware, Group III	36			36	3.9
White Ware	6	8		14	1.5
Puerco Black-on-red		2		2	.2
Totals	609	299	7	915	100.0

Table 96. Worked sherds, LA 14909

Provenience/ FS	Meters East	Level	Artifact	Ceramic Ware	Comments
Feature 2: 2-23	2-4	21	unknown	Reserve Plain Corrugated	rectangular; ground on 1 edge; 4.0 X 2.5 cm
Feature 3: 3-9	4	15	drilled	Tularosa Black-on-white	bowl rim; drilled from both sides
3-61	4-6	20	scraper	Reserve Incised Corrugated	broken; edges ground; 4.5 X 4.5 cm
3-70	2-4	24	drilled	Reserve Black-on-white	bowl rim; cylindrical perforation
3-72	2-3	24	disc	Reserve Punched Corrugated, neck-banded, smudged	roughly shaped; 6.1 X 5.8 cm
Feature 4: 4-11	3	22	scraper	Reserve Plain Corrugated	one edge ground, bevel; 4.3 X 2.7 cm
4-34	2-4	18	drilled	Reserve Black-on-white	bowl rim; cylindrical perforation
4-35	4-6	21	drilled	Tularosa Black-on-white	bowl rim; cylindrical perforation
4-42	4-5	18	drilled	Reserve Black-on-white	bowl rim; cylindrical perforation
4-76	2.2	29	disc	Tularosa Patterned Corrugated	continuous ground edge; mend hole; 7.0 X 7.1 cm
Feature 5: 5-49	6-8	18	disc	brown ware, smudged	half; continuous ground edge; 7.4 cm diameter
Feature 6: 6-7	2-4	28	disc	Tularosa Black-on-white	minimal grinding on one edge; 4.1 X 2.1 cm

Table 97. Summary of faunal remains from LA 14909

Feature:	2-3	3	3	4	4-5	19	10	8	9	15	Specimens		MNIs	
Meters east:	2-4	4-8	8-10	2-4	4-8									
Taxon/Level:	21-5	12-20	6-9	22-6	13-24	34	3	fill	all	fill	N	%	Min.	Max.
Sylvilagus sp.	1		4	2							7	12.7	3	3
Lepus sp.	2	4	1	2	3				10		22	40.0	2	7
Small sciurid			2								2	3.6	1	1
Large sciurid				1	1						2	3.6		2

Feature:	2-3	3	3	4	4-5	19	10	8	9	15	Specimens		MNIs	
Meters east:	2-4	4-8	8-10	2-4	4-8									
Taxon/Level:	21-5	12-20	6-9	22-6	13-24	34	3	fill	all	fill	N	%	Min.	Max.
Cynomys gunnisoni		1									1	1.8	1	1
Thomomys bottae					1	1					2	3.6	1	2
D. spectabilis								1			1	1.8	1	1
Neotoma sp.		1									1	1.8	1	1
Odocoileus hemionus								3			3	5.4	1	1
O. virginianus				1							1	1.8	1	1
cf. *M. gallopavo*										2	2	3.6	1	1
Small mammal					1						1	1.8		
Small-medium mammal or large bird							2				2	3.6		1
Large mammal					1					1	2	3.6		1
Artiodactyl									2	4	6	10.9		2
Totals	3	6	7	6	7	1	2	4	12	7	55		13	25
% Burned				33	14						3	5.4		
% Eroded/etched	67		14	50	14		100	25	100	29	24	43.6		

Table 98. Ceramic distribution, LA 14910

	Surface	Feature 2		Feature 3						Feature 4			Feature 5		Totals		
		2-4 E	4-6 E	0 - 2 E		2 - 4 E		4-6 E	10-11 E	0-2 E		4-6 E	2-4 E	8-10 E			
		1-10 cm	1-20 cm	1-10 cm		1-15 cm		20 cm	1-10 cm	10-15 cm		10-15 cm	1-10 cm	15-20 cm			
	J	J	J	J	B	J	B	B	J	J	B	J	J	J	J	B	%
Alma Plain	1														1		3.8
Brown Ware	3	1	1	2						3					10		38.5
Brown Ware, smudged					1						1					2	7.7
Reserve: Indented Corrugated												1			1		3.8
Plain Corrugated, smudged	2	1	1			1			1	1				1	8		30.8
Punched Corrugated, smudged													1		1		3.8
Smudged							1	2								3	11.5
Totals	6	2	2	2	1	1	1	2	1	4	1	1	1	1	21	5	99.9

Table 99. Summary of available water and soil conservation feature information, Gallo project (m)

Feature Type/ Site Number	Feature Number	Length	Width	Height
Check Dams: LA 6076	5	3.0	.95	.30
	25	3.5	.55	.29
	26	3.3	.60	.30
LA 14463	5	4.2+	.9-3.5	.30
	7	5.2+	1.6-3.0	
LA 14912	1	12.0	.20-.40	
LA 14915	2	3.6	.60	
	3	3.4	.90	.50
	4	5.7	1.00	.95
	5	3.0	.80	.50
	6	5.7	.40	1.00
	7	7.2	2.20	1.00
	8	3.0	2.00	
LA 14916	1			
LA 14918	1	3.6	.45	
	2	2.4	.50	
	4	2.0	.50	
	5	1.5	.30	
LA 14919	1	3.2	.70	
	4	3.1	.80	
	5	3.8	.30	
	6	3.5	.50	
	7	3.2	.40	
	8	5.2	.70	
	9	3.7	.60	

Feature Type/ Site Number	Feature Number	Length	Width	Height
Diversion walls: LA 14918	3	7.1	.40-.60	
LA 14919	3	11.6	.60	
Contour terraces: LA 14913	1	15.0	3.75*	
LA 14915	1	41.0	2.00	
Alignment-grid: LA 14913	5	3.0		

* includes the agricultural plot behind the wall

Table 100. Ratios of ceramics, lithic artifacts, ground stone, and bone (1:X) [?]

Site Type/ Site Number	Ceramics: Lithics	Ceramics: Ground Stone	Ceramics: Bone	Lithics: Ground Stone	Lithics: Bone	Bone: Ground Stone
Scatters: LA 6074	6.0					
LA 6077	.7					
LA 14917				15.0		
LA 14920	.0					
LA 14930					104.0	
Special Use: LA 14906	.2	9.9	5.9	38.6	22.7	1.7
Fieldhouses: LA 14882	12.4	53.0		4.2		
LA 14907	1.7		9.4			
LA 14910	13.0					
Habitation: LA 5407	4.2	26.7	3.5	6.3	.8	7.6
LA 6075	3.5	39.0	4.5	11.2	1.3	8.7
LA 6076	5.9	35.7	35.7	6.1	6.1	1.0
LA 14858	22.4	27.5	26.1	1.2	1.0	1.3
LA 14908	4.8	329.5	119.8	68.2	24.8	2.7
LA 14909	7.7	114.4	16.6	14.9	2.2	6.9

Note: Bone does not include flotation bone.

Table 101. Comparative ceramic dates for wares found at the Gallo sites (A.D.)

Ceramic Ware	Southwest		Dead Valley, Arizona		Southeast Arizona		Fence Lake, New Mexico	
	Range		Range		Range		Range	
Alma Plain	300	951						
Alma Textured	775	927						
Alma Neck-Banded	665-700	910+						
San Francisco Red	750	950			750	950		
Reserve: Black-on-white	1032	1090	950	1125	950	1100	1100	1200
Incised Corrugated			950	1125				
Indented Corrugated			1050	1250				
Plain Corrugated			1000	1200	1000	1200		
Punched Corrugated			1000	1150				
Smudged	750	800			750	800		
Tularosa Black-on-white	1150	1300	1100	1250	1150	1300	1200	1300
Patterned Corrugated			1050	1250	1050	1250		
Red Mesa Black-on-white	850	1125	850	1050			950	1050
Puerco Black-on-white	1010	1123	950	1125			1000	1200
Gallup Black-on-white	1000	1125					1030	1100
Socorro Black-on-white	1050	1300						
Mimbres Black-on-white	1113	1250+			1110	1350		
Puerco Black-on-red	1030	1124	1050	1150	1000	1200	1020	1200
Wingate Black-on-red	1050	1200	1050	1150			1100	1200
St. Johns Black-on-Red	1175	1300			1170	1300	1200	1270

Sources: Southwest: Breternitz 1966:68-103 (best dates); Dead Valley: Doyle and Debowski 1980:13, Table 8; southeast Arizona: Bronitski and Merrit 1986:166, Table 9; Fence Lake: Mills 1987a: 104, Fig. 11.5.

Table 102. Estimated occupation dates, earliest to latest

Site	Dates (A.D.)	
	Beginning	End
LA 5407	520+	
LA 14906	520+	
LA 14908	pre 950	1150
LA 14909	1000-1050	1120-1150
LA 14882	1050	
LA 14858	1050	1150-1170+
LA 6076	pre 1100+	1200?
LA 14907	pre 1150	1170+
LA 6075	1100-1150	1200-1250

Table 103. Petrographic analysis of sherd proveniences

Site/Sample No.	FS No.	Provenience	Ceramic Ware
LA 5407: G-1	39-847	Feat. 39, NW quad, floor fill	San Francisco Red
G-2	39-847	Feat. 39, NW quad, floor fill	Alma Plain
G-3	39-847	Feat. 39, NW quad, floor fill	Alma Plain
G-4	39-847	Feat. 39, NW quad, floor fill	Alma Plain
G-5	39-884	Feat. 39, NW quad, floor fill	San Francisco Red
G-6	39-884	Feat. 39, NW quad, floor fill	San Francisco Red
LA 14906: G-7	963	Feat. 19, 14-16 N, 0-5 cm	Alma Plain
G-8	961	Feat. 8, 16-18 N, 0-5 cm	Alma Plain
G-9	182	Feat. 16, surface	San Francisco Red
G-10	963	Feat. 19, 14-16 N, 0-5 cm	San Francisco Red
LA 6076: G-11	28-19	Feat. 28, 105 cm to floor	Reserve Plain Corrugated

Site/Sample No.	FS No.	Provenience	Ceramic Ware
G-12	28-19	Feat. 28, 105 cm to floor	Reserve Plain Corrugated
G-13	28-38	Feat. 28, 155-170 cm	Pueblo II Corrugated
G-14	28-38	Feat. 28, 155-170 cm	Plain Brown
G-15	59-34	Feat. 59, floor fill	Pueblo II Corrugated
G-16	59-34	Feat. 59, floor fill	Pueblo II Corrugated
G-17	59-34	Feat. 59, floor fill	Reserve Plain Corrugated
G-18	59-34	Feat. 59, floor fill	Reserve Indented Corrugated
LA 14909: G-19	17-14	Feat. 17, Level 13	Reserve Plain Corrugated (very narrow)
G-20	9-11	Feat. 9, hole 1, Levels 7-8	Reserve Plain Corrugated (medium)
G-21	2-30	Feat. 2, 3-4 E, Level 22	Reserve Plain Corrugated (medium/blunt)
G-22	4-41	Feat. 4, 6-8 E, Level 17	Reserve Plain Corrugated (wide)
G-23	2-26	Feat. 2, 2-4 E, Level 22	Pueblo II Corrugated
G-24	3-86	Feat. 3, 5-6 E, Level 23	Pueblo II Corrugated
LA 14858: G-25	6-20	Feat. 6, hearth	Reserve Indented Corrugated
G-26	16-18	Feat. 16, floor	Plain Brown, polished
G-27	16-18	Feat. 16, floor	Plain Brown, unpolished
G-28	15-5	Feat. 15, floor	Reserve Plain Corrugated (narrow)
G-29	15-5	Feat. 15, floor	Reserve Indented Corrugated (narrow)
G-30	15-5	Feat. 15, floor	Reserve Indented Corrugated (medium)

Table 104. Ceramic types in the sample

Ceramic Ware	N
Alma Plain	5
San Francisco Red	5
Reserve Plain Corrugated	7
Reserve Indented Corrugated	4
Reserve/Tularosa Corrugated	1
Plain Brown	3
Pueblo II Corrugated	5
Total	30

Table 105. Petrographic data for 30 Gallo sherds

LA/ Sample	TEMPERING MATERIAL														C H E R T	CLAY MATRIX			Sherd Type
	Rock Fragments			Sherd Fragments			Feldspars			Quartz			Ferromag. Min.			Silt in Clay	Est. % of Temp.	Texture	
	Type	mm	%	Type	mm	%	Type	mm	%	Type	mm	%	Type	%					
LA 5407 G1	aug. lat.	1.0	84				tw	.3	5	poly	.8	5	aug. br. bio.	5 1		ab	25	M	San Francisco Red
G2	aug. lat.	1.1	92				tw	.4	2	poly str	.4 .2	1 2	aug.	2		ab	30	M	Alma Plain
G3	aug. lat.	1.1	88				tw	.3	2	poly	.3	5	aug. br. bio.	2 1		ab	30	M	Alma Plain
G4	aug. lat.	1.0	94				tw	.3	1	poly	.8	2	aug. br. bio.	1 1		ab	30	M	Alma Plain
G5	sand + v. rock	1.6	25				tw untw micro	.3 .6 .4	3 5 1	poly str	.5 .2	65 1			P	ab	20	M	San Francisco Red
G6	sand + v. rock	.6	10				tw untw micro	1.6 .6 .3	4 3 3	poly str	.4 .3	78 2				ab	25	M	San Francisco Red
LA 14906 G7	sand + v. rock	.8	5				tw untw micro	.5 .4 .2	3 2 2	poly	.4	88				ab	25	M	Alma Plain
G8	sand + v. rock	1.6	7				tw untw micro	.4 .3 .3	5 3 2	poly	.4	83			P	ab	25	M	Alma Plain
G9	sand + v. rock	.6	5				tw untw micro	.5 .4 .3	4 3 2	poly str	.4 .3	87 3	br. bio.	t		ab	15	M	San Francisco Red
G10	sand + v. rock	2.5	25				tw untw micro	.8 .5 .4	3 2 3	poly str	.5 .2	65 2	pryoxene	t		v. ab.	25	M	San Francisco Red
6076 G11	ande- site	1.1	95							str	.2	2	pryoxene	2		ab	20	M	Reserve Plain Corrugated
G12	sand + v. rock	1.6	30				tw untw	.5 .3	4 3	str	.3	60			P	ab	10	M	Reserve Plain Corrugated
G13				util.	1.3	98				str	.1	2				sp	15	H	Pueblo II Corrugated

LA/ Sample	TEMPERING MATERIAL															CHERT	CLAY MATRIX			Sherd Type
	Rock Fragments			Sherd Fragments			Feldspars			Quartz			Ferromag. Min.				Silt in Clay	Est. % of Temp.	Texture	
	Type	mm	%	Type	mm	%	Type	mm	%	Type	mm	%	Type	%					
G14	sand + v. rock	.5	5				tw untw micro	.3 .3 .2	1 2 1	str	.5	90	br. bio?	1		ab	20	M	Plain Brown
G15				util.	.7	98				str	.1	2				sp	15	H	Pueblo II Corrugated
G16				util.	.7	97				str	.1	3				sp	15	H	Pueblo II Corrugated
G17	ande- site	1.5	87				zoned	1.1	10	str	.2	1	pryoxene br. bio.	1 1		ab	35	M	Reserve Plain Corrugated
G1	meta- morph	.8	10 0				tw micro	.3 .5	t t						P	ab	20	M	Reserve Indented Corrugated
LA 14909 G19	ande- site	1.1	97							str	.2	2	pryoxene	1		ab	25	M	Reserve/Tularosa Plain Corrugated
G20	sand + v. rock	1.5	5				tw untw micro	.5 .4 .3	2 2 1	poly str	.6 .6	5 85			P	ab	25	M	Reserve Plain Corrugated
G21	sand + v. rock	.9	25				tw untw	.3 .5	1 2	str	.5	70	br. bio.	t	P	ab	15	M	Reserve Plain Corrugated
G22	sand + v. rock	2.0	35				tw untw micro	.5 .2 .6	1 1 1	poly str	.4 .3	1 60			P	ab	20	M	Reserve Plain Corrugated
G23	meta- morph	1.3	85				tw micro	.5 1.1	5 10						P	sp	15	H	Pueblo II Corrugated
G24	meta- morph	1.0	90				tw micro	.6 1.3	2 8						P	sp	15	H	Pueblo II Corrugated
LA 14858 G25	sand + v. rock	.5	5				tw untw micro	.3 .3 .3	2 2 1	str	1.0	90			P	ab	20	M	Reserve Indented Corrugated
G26	sand + v. rock	1.6	5				tw untw micro	.2 .2 .3	2 1 1	str poly	.4 .6	90 1				ab	25	M	Plain Brown
G27	sand + v. rock	.8	10				tw untw	.4 .3	1 2	str	.4	85	br. bio.	2		v. ab	20	M	Plain Brown
G28	ande- site	1.1	95							str	.2	3	pyroxene br. bio.	1 1		ab	35	M	Reserve Plain Corrugated

LA/ Sample	TEMPERING MATERIAL														CHERT	CLAY MATRIX			Sherd Type
	Rock Fragments			Sherd Fragments			Feldspars			Quartz			Ferromag. Min.			Silt in Clay	Est. % of Temp.	Texture	
	Type	mm	%	Type	mm	%	Type	mm	%	Type	mm	%	Type	%					
G29	andesite	1.0	98							str	.3	2	br. bio.	t		ab	20	M	Reserve Indented Corrugated
G30	andesite	3.5	97							str	.2	2	pyroxene	1		ab	25	M	Reserve Indented Corrugated

v. rock = volcanic rock; tw = twinned; poly = polycrystalline; br bio = brown biotite; ab = abundant; M = mottled; metamorp=metamorphic rock; untw = untwinned quartz; t = trace; v. = very; H = homogeneous; micro = microcline; str = straight or monocrystalline; sp = sparse

Table 106. Temper categories

Temper Category	N
Sand plus volcanic rock fragments	14
Andesite rock fragments	6
Augite latite rock fragments	4
Metamorphic rock fragments	3
Sherd	3
Total sherds	30

Table 107. Petrographic data for sherds with sand plus volcanic rock temper

No.	LA No.	Sand			Volcanic Rock		Feldspars			Chert	Ferro-magnes-ians	Silt in clay	Tex-ture	% of Temper
		mm	type	%	mm	%	untw	tw	mc					
San Francisco Red														
G-5	5407	.5	poly	65	1.6	25	P	P	P	P		ab	M	20
G-6	5407	.4	poly	78	.6	10	P	P	P			ab	M	25
G-9	14906	.4	poly	85	.6	7	P	P	P		br bio	ab	M	20
G-10	14906	.5	poly	65	2.5	25	P	P	P	P	pyroxene	ab	M	25
Alma Plain														
G-7	14906	.4	poly	88	.8	5	P	P	P			ab	M	25
G-8	14906	.4	poly	83	1.6	7	P	P	P	P		ab	M	25
Reserve Plain Corrugated														
G-12	6076	.3	str	60	1.6	30	P	P		P		ab	M	10
G-20	14909	.6	str	90	1.5	5	P	P	P	P		ab	M	25
G-21	14909	.5	str	70	.9	25	P	P		P	br bio	ab	M	15
G-22	14909	.4	str	60	2.0	35	P	P	P	P		ab	M	20
Reserve Indented Corrugated														
G-25	14858	1.0	str	90	.5	5	P	P	P	P		ab	M	20
Plain Brown Ware														
G-14	6076	.5	str	90	.5	5	P	P	P		br bio	ab	M	20
G-26	14858	.6	str	90	1.6	5	P	P	P			ab	M	25
G-27	14858	.4	str	85	.8	10	P	P	P		br bio	ab	M	20

mc = microcline; P = present; poly = quartz grains with undulatory extinction; ab = abundant; str = quartz grains with straight extinction; m = mottled texture; br bio = brown biotite; mm = maximum size

Table 108. Petrographic data for sherds with andesite rock fragments

No.	LA No.	Rock Fragments		Quartz			Ferro-magnesian mineral	Other	Silt in Clay	Texture	% of Temper
		mm	%	mm	kind	%					
Reserve Plain Corrugated											
G-11	6076	1.1	95	.2	str	2	pyroxene		ab	M	20
G-17	6076	1.5	87	.2	str	1	pyroxene br bio	zoned feldspars	ab	M	35
G-28	14858	1.1	95	.2	str	3			ab	M	35
Reserve Indented Corrugated											
G-9	14858	1.0	98	.3	str	2	br bio		ab	M	20
G-30	14858	3.5	97	.2	str	2	pyroxene		ab	M	25
Reserve/Tularosa Plain Corrugated											
G-19	14908	1.1	97	.2	str	2	pyroxene		ab	M	25

str = quartz grains with straight extinction; ab = abundant; br bio = brown biotite; M = mottled texture

Table 109. Petrographic data for sherds with augite latite rock fragments

No.	LA No.	Rock Fragments		Quartz			Ferro-magnesian mineral	Other	Silt in Clay	Texture	% of Temper
		mm	%	mm	kind	%					
San Francisco Red											
G-1	5407	1.0	84	.8	poly	5	augite br bio	twinned feldspar	ab	M	25
Alma Plain											
G-2	5407	1.1	92	.4	poly	1	augite	twinned feldspar	ab	M	30
G-3	5407	1.1	88	.3	poly	5	augite br bio	twinned feldspar	ab	M	30
G-4	5407	1.0	94	.8	poly	2	augite br bio	twinned feldspar	ab	M	30

poly = quartz grains with undulatory extinction; ab = abundant; br bio = brown biotite; M = mottled texture

Table 110. Petrographic data for sherds with metamorphic rock fragments

No.	LA No.	Rock Fragments		Feldspars		Chert	Silt in Clay	Texture	% of Temper
		mm	%	Twinned	Micro				
Pueblo II Corrugated									
G-23	14909	1.3	85	P	P	P	sp	H	15
G-24	14909	1.0	90	P	P	P	sp	H	15
Reserve Indented Corrugated									
G-18	6076	.8	100	P	P	P	ab	M	20

micro = microcline; sp = sparse; H = homogeneous texture; ab = abundant; M = mottled texture; P = present

Table 111. Petrographic data for sherds with crushed sherd fragments

No.	LA No.	Sherd Fragments			Quartz			Silt in Clay	Texture	% of Temper
		mm	%	Kind	mm	Kind	%			
Pueblo II Corrugated										
G-13	6076	1.3	98	utility	.1	str	2	sp	H	15
G-15	6076	.7	98	utility	.1	str	2	sp	H	15
G-16	6076	.7	97	utility	.1	str	3	sp	H	15

str = quartz grains with straight extinction; sp = sparse; H = homogeneous texture

Table 112. Ceramic types, temper categories, and sites

Ceramic Ware	Temper Category	No. of Sherds	Site
San Francisco Red	augite latite	1	LA 5407
	sand and volcanic rock	2	LA 5407
		2	LA 14906
Alma Plain	augite latite	3	LA 5407
	sand and volcanic rock	2	LA 14906
Reserve Plain Corrugated	andesite rock fragments	2	LA 6076
		1	LA 14858
	sand and volcanic rock	3	LA 14909
		1	LA 6076

Ceramic Ware	Temper Category	No. of Sherds	Site
Reserve Indented Corrugated	metamorphic rock fragments	1	LA 6076
	sand and volcanic rock	1	LA 14858
	andesite rock fragments	2	LA 14858
Reserve/Tularosa Plain Corrugated	andesite rock fragments	1	LA 14909
Pueblo II Corrugated	sherd	3	LA 6076
	metamorphic rock fragments	2	LA 14909

Table 113. Percentages of brown wares and gray wares from survey data

Survey/Period	Dates (A.D.)	% Brown Ware	% Gray Ware	No. of Samples
Fence Lake: 1	950-1050	27	73	
3	1050-1100	26	74	
4	1050-1125	30	70	
5	1100-1150	30	70	
6	1100-1175	38	62	
7	1150-1200	44	56	
8	1150-1200	43	57	
Coal Lease Area: Pueblo I	700-900	1	99	1
Pueblo I-II	800-1000	30	70	47
Pueblo II	900-1100	25	75	52
Pueblo II-III	1050-1150	40	59	32
Pueblo III	1100-1250	36	64	12
Pueblo III	1250-1300	36	64	8

Sources: Fence Lake: Fowler 1985:128; Coal Lease Area: Camilli et al. 1988:5 31-48

Table 114. Percentages of brown wares and gray wares from excavations

Site	Dates (A.D.)	Brown Ware	% Gray Ware	Sample Size
Cerro Colorado	BM III	5-10	90-95	?
Mariana Mesa: 486	850-900	70.0	30.0	223
188	1075	56.2	43.8	121
494	1120+	96.8	3.1	1019
Fence Lake: LA 48644	1050-1125	15.5	84.5	517
LA 48540	1075-1125	3.3	96.7	242
LA 48649	1100-1175	20.9	79.1	723
LA 48642	1100-1200	27.1	72.8	711
Williams Ranch: pithouses	900s	99.6	.4	800
pueblo	1015	99.5	.5	406
Gallo: LA 5407	520+	100.0	0	3785
LA 14908	1000-1150	95.4	4.6	1177
LA 14909	1000-1150	95.4	4.5	798
LA 14858	1050-1150	99.7	.3	997
LA 6076	1100	61.5	38.5	208
LA 6076	1150+	96.1	3.9	699
LA 14882	1150+	100.0	0	187
LA 6075	1150-1200	94.2	5.7	521
Galitta Springs: LA 6083	Early Reserve	99.7	.2	2406
LA 6083	Late Reserve	99.8	.2	426
LA 6083	Tularosa	99.1	.9	528

Sources: Cerro Colorado: Bullard 1962:11; Mariana Mesa: McGimsey 1980: Tables 17, 20, 21; Fence Lake: Mills 1987a:132-141; Williams Ranch Site: Smith 1973:28; Gallita Springs: Kayser 1975: Table 42.

Table 115. Comparison of ware and vessel form percentages for Fence Lake and the Gallo sites (early to late)

Site	N	Brown Ware		Gray Ware		White Ware		Red Ware	
		Jar	Bowl	Jar	Bowl	Jar	Bowl	Jar	Bowl
Gallo: LA 5407	3791	93.1	6.9				.1		
LA 14906	288	99.6	.4						
LA 14908	1316	75.1	12.8	4.0	.1	5.3	1.7	.1	.8
LA 14909	908	58.4	25.7	4.0		4.7	7.0		.2
LA 14858	1172	43.3	39.4	.3		10.2	2.1		2.8
LA 6076: Site total	3664	62.4	17.2	5.8		9.5	3.6		1.4
Early rooms	238	46.2	4.6	33.6		8.0	7.1		.8
Later rooms	749	62.1	23.1	3.5		7.6	3.1		.7
LA 14907	50	80.0	4.0			6.0	2.0	8.0	
LA 14882	211	48.3	38.9			7.6	3.8	1.4	
LA 6075	622	22.8	58.2	3.2	1.6	9.5	4.5		.2
Fence Lake: LA 48644	625	11.5	1.3	69.8	.2	12.2	5.1		
LA 48640	267	2.3	.7	87.3	.4	4.1	4.7		.4
LA 48649	1029	13.5	1.3	55.6	.5	22.0	7.1		.1
LA 48642	1010	16.9	1.8	51.2		19.1	7.6	1.1	2.3

Fence Lake source: Mills 1987a: Appendix 1

Table 116. Core type frequency by material for all sites

Core Type	Rhyolite	Chert/ Chalcedony	Siltstone	Igneous	Quartzite	Silicified Wood	Obsidian	Total
Single platform	9	11		10	2	1		33
Test core	1							1
Two parallel	13	8	2	6		1		20
Two adjacent	13	10	2	8		1	1	35
Three adjacent	7	5						12
Two adjacent, single	2	1						3
Two parallel, single	1							1
Two parallel, adjacent	1							1
Four adjacent		2		1				3

Core Type	Rhyolite	Chert/ Chalcedony	Siltstone	Igneous	Quartzite	Silicified Wood	Obsidian	Total
Indeterminate*		1						1
Total	37	38	4	25	2	3	1	110

* fire fractured

Table 117. Cortex percentage distribution among material types (LA 5407, LA 6074, LA 6075, LA 6076, and LA 14858)

Material	Cortex Percentage						Total
	0	1-25%	26-50%	51-75%	76-99%	100%	
Rhyolite	59	21	8	6	5	t	99
Chert/chalcedony	62	23	7	3	4	1	100
Igneous	38	23	17	6	14	2	100
Obsidian	55	21	14	5	5	0	100
Siltstone	44	44	5	5	0	0	98
Quartzite	30	22	9	22	17	0	100
Silicified wood	52	28	11	3	6	0	100

t = < 1%

Table 118. Frequencies of edge angles among durable and brittle materials for shavers

Edge Angle (Degrees)	Rhyolite/Igneous		Chert, Chalcedony, Obsidian, Silicified Wood	
	N	%	N	%
15		31	1	67
20	4		5	
25	2		8	
30	4	69	2	33
35	9		5	
Total	19	100	21	100

Table 119. Knife edge angle distribution among material groups

Edge Angle	Durable	Brittle	Total
15	1	5	6
20	16	6	22
25	8	9	17
30	4	4	8
35	13	9	22
40	2	2	4
Total Edges	44	35	79

Table 120. Material distribution of combination tools

Tool Combination	Durable	Brittle		Total
	Rhyolite	Chert, Chalcedony	Obsidian	
Knife/scrapers	6	4		10
Knife/shavers	4	1		5
Shaver/scrapers	1	5	1	7
Total	11	10	1	22

Table 121. Mean dimensions of complete drills (cm)

Dimension	N	Mean	SD	Minimum	Maximum
Length	6	3.6	.7	2.6	3.8
Width	6	2.3	.5	1.6	3.2
Thickness	6	1.1	.3	.7	1.8

Table 122. Dimensions of complete notched tools (cm)

Tool	Material	Length	Width	Thickness
Notched scrapers	rhyolite	4.1	3.7	1.6
	silicified wood	3.2	3.5	1.9
Notched tools	rhyolite	5.1	3.5	1.9
	rhyolite	3.4	3.0	1.4

Table 123. Percentage of tool groups within sites (unmodified tools and all tools)

Site	Period(s)	Durable		Brittle		Number of Edges
		Acute	Obtuse	Acute	Obtuse	
UNMODIFIED: LA 14930	Archaic? and later	33.3	33.3		33.3	3
LA 14906	Early Pithouse +	14.2	28.5	22.8	31.4	35
LA 5407	Early Pithouse	27.6	50.7	13.8	7.6	65
LA 14920	unknown	36.8	47.3	10.5	5.2	19
LA 6076	Early Pueblo	26.8	26.8	20.4	25.8	93
LA 6075	Early Pueblo	24.0	36.0	28.0	12.0	25
LA 14858	Early Pueblo	13.6	18.1	31.8	36.3	22
LA 14908	Early Pueblo	35.5	37.7	15.5	11.1	45
LA 14909	Early Pueblo	33.3	50.0	16.6		6
ALL TOOLS: LA 14930	Archaic? and later	12.5	12.5	37.5	37.5	8
LA 14906	Early Pithouse +	12.5	29.1	18.7	39.5	48
LA 5407	Early Pithouse	16.6	63.1	8.7	11.1	114
LA 14920	unknown	26.9	57.6	7.6	7.6	26
LA 6076	Early Pueblo	24.0	33.3	18.5	24.0	108
LA 6075	Early Pueblo	16.6	38.8	25.0	19.4	36
LA 14858	Early Pueblo	10.0	26.6	26.6	36.6	30
LA 14908	Early Pueblo	32.0	40.0	14.0	14.0	50
LA 14909	Early Pueblo	22.2	55.5	11.1	11.1	9

Table 124. Domination of plant processing (obtuse/durable) versus animal processing (acute/brittle) tools based on percentages

Site	Tool Domination	Tool and Debitage Domination	Tool Group Domination (All Tools)	Tool Group Domination (Unmodified)
LA 14930	brittle	brittle	acute/brittle	obtuse/durable
LA 14906	brittle	durable	obtuse/durable	obtuse/durable
LA 5407	durable	durable	obtuse/durable	obtuse/durable
LA 14920	durable	durable	obtuse/durable	obtuse/durable
LA 6076	durable	equal	obtuse/durable	obtuse/durable*
LA 6075	durable	brittle	obtuse/durable	obtuse/durable

Site	Tool Domination	Tool and Debitage Domination	Tool Group Domination (All Tools)	Tool Group Domination (Unmodified)
LA 14858	brittle	brittle	equal	acute/brittle
LA 14908	durable	durable	obtuse/durable	obtuse/durable
LA 14909	durable	durable	obtuse/durable	obtuse/durable

* by a small margin

Table 125. Tool percentages and frequencies by site

Site	No. Lithics	No. Tools	Percent Tools
LA 5407	848	96	8.8
LA 6074	2	0	
LA 6075	179	33	18.4
LA 6076	624	101	16.2
LA 6077	11	1	9.1
LA 14858	54	25	46.3
LA 14882	17	0	
LA 14906	888	44	4.9
LA 14907	28	3	10.7
LA 14908	279	49	17.6
LA 14909	121	14	11.5
LA 14910	6	2	33.3
LA 14917	15	2	13.3
LA 14920	230	22	9.6
LA 14930	417	9	2.2

Table 126. Tool type distribution, LA 5407

Tool Type	Rhyolite	Obsidian	Chert/ Chalcedony	Igneous	Quartzite	Total
Shaver	3	3	2	1		9
Knives	8	2	1			11
Scrapers	43	5	2	6	1	57
Combination	5	1	1			7
Drills	2					2

Tool Type	Rhyolite	Obsidian	Chert/ Chalcedony	Igneous	Quartzite	Total
Notched tools	1					1
Facially retouched	3	1				4
Choppers				1		1
Indeterminate marginal retouch	1	1		1	1	4
Totals	66	13	6	9	2	96

Table 127. Material type distribution, LA 5407 (hammerstones and projectile points excluded)

Material Type	N	%
Durable Materials: Rhyolite	405	48.3
Igneous	72	8.6
Siltstone	4	.5
Quartzite	9	1.1
Brittle Materials: Chert/chalcedony	213	25.4
Obsidian	131	15.6
Silicified wood	4	.5
Totals	838	100.0

Table 128. Flake type distribution by material type, LA 5407

Material	Core	Biface	Early Biface	Platform Rejuvenation	Bipolar	Total
Durable: Rhyolite	347	1	4	3		355
Igneous	55					55
Siltstone	2					2
Quartzite	8					8
Brittle: Chert/chalcedony	114	3	6	3	1	127
Obsidian	82	34	5	2		123
Silicified wood	3					3
Totals	611	38	15	8	1	673

Table 129. Core type and material distribution, LA 5407

Core Type	Rhyolite	Chert/ Chalcedony	Igneous	Obsidian	Total
Test	1				1
Single platform	2		2		4
2 adjacent	1	1	2	1	5
3 adjacent	2	2			4
2 adjacent, 1 single	1	1			2
Indeterminate fire-fractured		1			1
Totals	7	5	4	1	17

Table 130. Mean dimensions of complete hammerstones, LA 5407 (cm)

Dimension	N	Mean	SD	Minimum	Maximum
Length	8	8.6	2.8	3.9	12.4
Width	8	5.6	3.1	2.0	9.4
Thickness	8	4.7	1.7	2.0	6.9

Table 131. Artifact distribution, LA 5407

Provenience	Debitage	Tools	Cores	Total	%
Strip zones (F. 0-23)	98	12	2	112	13.3
East side storage/trash F. 26, hearth rock pile	7			7	.8
F. 27 storage pit area	19	7	1	27	3.2
F. 30 storage pit	5	5		10	1.2
F. 32 storage pit	20	2		22	2.6
F. 36 storage pit	6	1		7	.8
Antechamber (F. 25)	165	22	1	188	22.4
F. 34 antechamber storage	2	1		3	.4
Main chamber (F. 39)	374	42	12	428	51.1
Dog burial (F. 42)	4		1	5	.6
F. 28 trash area	2	1		3	.4
F. 40 trash area	23	3		26	3.1
Totals	725	96	17	838	99.9

Table 132. Mineral distribution, LA 5407

Provenience	Selenite	Calcite	Hematite	Quartz Crystal	Mica	Yellow Ocher	Malachite/ Azurite	Total
Main chamber (F. 39): Fill	2	1					1	4
Floor Fill	1	8	1			1		11
Floor Contact	1	4	1	1		3		10
Antechamber (F. 25): Fill			1					1
Floor Fill	1		1		1			3
Feature 6 Fill			1					1
Feature 22 Fill			1					1
Feature 23 Fill		1						1
Feature 27 Fill			1					1
Feature 36							1	1
Totals	5	14	7	1	1	4	2	34

Table 133. Lithic material distribution, LA 6075

Material	N	Percent
Durable Materials: Rhyolite	72	40.2
Igneous	9	5.0
Siltstone	3	1.7
Quartzite	1	.6
Brittle Materials: Chert/chalcedony	69	38.5
Obsidian	2	1.1
Silicified wood	23	12.8
Total	179	99.9

Table 134. Tool type distribution by material, LA 6075

Tool Type	Rhyolite	Igneous	Chert/ Chalcedony	Obsidian	Silicified Wood	Total
Shavers	1		4		1	6
Knives	2		2	1		5
Scrapers	8	1	4			13
Combination tools	1					1
Drills	1		1			2
Facially retouched	1	1	3			5
Choppers	1					1
Totals	15	2	14	1	1	33

Table 135. Core type distribution, LA 6075

Core Type	Rhyolite	Igneous	Chert/ Chalcedony	Silicified Wood	Total
Two adjacent	1	1	1		3
Two parallel	1	1		1	3
Single			1		1
Totals	2	2	2	1	7

Table 136. Artifact distribution, LA 6075

Provenience	Debitage	Tools	Cores	Total
Test pits (F. 0-15)	55	16	4	75
Test trenches (F. 33-35)	14	3		17
Pit structure (F. 16)	49	10	2	61
Masonry rooms (F. 26-28)	12	3	1	16
Natural feature (F. 17)	9	1		10
Totals	139	33	7	179

Table 137. Artifact distribution by material, LA 6076

Material	Debitage	Tools	Cores	Hammer-stones	Total	
					N	%
Durable Materials: Rhyolite	141	50	12		203	32.5
Igneous	74	3	7	5	89	14.3
Siltstone	11		2		13	2.1
Quartzite	12	3	1	2	18	2.9
Brittle Materials: Chert/chalcedony	184	35	15	2*	236	37.8
Silicified wood	55	10			65	10.4
Totals	477	101	37	9	624	100.0

* geodes

Table 138. Tool type distribution by material, LA 6076

Tool Type	Rhyolite	Igneous	Quartzite	Chert/ Chalcedony	Silicified Wood	Total
Shavers	5			2	3	10
Knives	14	2	2	10	2	30
Scrapers	27			15		42
Combination tools				3		3
Drills				1	2	3
Notched tools					1	1
Facially retouched	2	1		2	1	6

Choppers	1		1			2
Indeterminate	1			2	1	4
Totals	50	3	3	35	10	101

Table 139. Core type distribution by material, LA 6076

Core Type	Rhyolite	Siltstone	Igneous	Quartzite	Chert/ Chalcedony	Totals
Single	1		2	2	5	9
Two adjacent	5	1	2		5	13
Two parallel	1	1	3		3	8
Three adjacent	4				2	6
Two parallel, one adjacent	1					1
Totals	12	2	7	2	15	37

Table 140. Lithic artifact distribution, LA 6076

Provenience	Debitage	Tools	Cores	Hammer-stones	Totals
Surface	56	24	4		84
Strip zones (F. 1-4, 6-8, 21)	86	13	8	1	108
Roasting pit and area (F. 27)	17				17
Check dams (F. 5, 25, 26)	22	4	1	1	28
Pit Structures: F. 28 and area	15	5	1		21
F. 59 and area	55	6	4	1	66
Rooms: F. 29	38	12	4	1	55
F. 31/36	16	3	3	1	23
F. 34	4	1			5
F. 35	1	3			4
F. 43	5	1			6
F. 57/58	33	8	7		48
F. 60 and area	24	2	3		29

Provenience	Debitage	Tools	Cores	Hammer-stones	Totals
No feature associated	105	19	2	3	129
Totals	477	101	37	9	624

Table 141. Lithic artifact distribution by material, LA 14858

Material	Debitage	Tools	Cores	Hammer-stones	Totals	
					N	%
Durable Materials: Rhyolite	7	10	1		18	33.3
Igneous	3	1		1	5	9.3
Brittle Materials: Chert/chalcedony	13	13	2		28	51.8
Obsidian		1			1	1.8
Silicified wood	2				2	3.7
Totals	25	25	3	1	54	99.9

Table 142. Mean debitage size for all materials, LA 14858 (cm) (n=15)

Dimension	Mean	SD	Minimum	Maximum
Length	2.9	.96	2.0	5.9
Width	2.5	1.0	1.7	6.2
Thickness	.7	.2	.5	1.0

Table 143. Tool type distribution by material, LA 14858

Tool Type	Rhyolite	Igneous	Chert/ Chalcedony	Obsidian	Total
Shavers	1		2		3
Knives	2		4		6
Scrapers	4	1	2	1	8
Combination			4		4
Notched tools	2				2
Unfinished biface	1				1
Indeterminate			1		1
Totals	10	1	13	1	25

Table 144. Debitage reduction stage percentage of rhyolite for Phase 2 sites*

LA No.	Reduction Stage					Totals	
	Primary	Secondary	Tertiary	Angular Debris	Core Fragment	%	N
14882	50	50				100	4
14906	4	67	24	5	1	101	323
14907		100				100	1
14908	11	60	13	8	8	100	119
14909	14	71	5	2	7	99	42
14917	11	89				100	9
14920	7	76	10	6	1	100	83
14930	11	79	5	3	2	100	61

* LA 14910 has no rhyolite flakes.

Table 145. Debitage reduction stage percentage of chert/chalcedony for Phase 2 sites

LA No.	Reduction Stage					Totals	
	Primary	Secondary	Tertiary	Angular Debris	Core Fragment	%	N
14882		60		40		100	5
14906	15	55	11	18	1	100	402
14907	40	40	10	10		100	10
14908	13	44	5	38		100	55
14909	6	61	9	24		100	33
14910		67			33	100	3
14917	67				33	100	3
14920	12	47	26	15		100	74
14930	4	55	27	14		100	237

Table 146. Lithic artifact distribution by material, LA 6077

Material	Flakes	Angular Debris	Tool	Total
Durable Materials: Rhyolite	2	1		3
Igneous	2			2
Siltstone	3			3
Brittle Materials: Chert/chalcedony	2		1	3
Totals	9	1	1	11

Table 147. Lithic artifact distribution by material, LA 14882

Material	Primary	Secondary	Angular Debris	Total
Durable Materials: Rhyolite	2	2		4
Igneous		1		1
Siltstone			1	1
Brittle Material: Chert/chalcedony		3	2	5
Totals	2	6	3	11

Table 148. Core type distribution by material, LA 14882

Core Type	Rhyolite	Igneous	Total
Single		2	2
Two adjacent	2	1	3
Two parallel		1	1
Totals	2	4	6

Table 149. Debitage stage reduction distribution, LA 14906

Material	Primary	Secondary	Tertiary	Angular Debris	Core Fragment	Total	
						N	%
Durable Materials: Rhyolite	12	217	77	15	2	323	39.4

Igneous	4	37	4	6		51	6.2
Quartzite	4	8		1		13	1.6
Siltstone	6	13		1		20	2.4
Brittle Materials: Chert/chalcedony	61	222	45	71	3	402	49.0
Obsidian		5	1			6	.7
Silicified wood	2			2	1	5	.6
Total	89	502	127	96	6	820	99.9

Table 150. Core type distribution by material, LA 14906

Core Type	Rhyolite	Igneous	Chert/ Chalcedony	Silicified Wood	Total
Single platform	2	2		1	5
Two parallel		1	2		3
Two adjacent	1		2	1	4
Four adjacent			1		1
Total	3	3	5	2	13

Table 151. Tool type distribution, LA 14906

Tool Type	Rhyolite	Igneous	Chert/ Chalcedony	Silicified Wood	Obsidian	Total
Shavers	3					3
Knives	1	1	5		1	8
Scrapers	8		9	1		18
Combination	2					2
Facially retouched	1		7	1		9
Indeterminate	3		1			4
Total	18	1	22	2	1	44

Table 152. Complete hammerstone dimensions, LA 14906 (cm)

Material	Length	Width	Thickness
Basalt	8.8	7.8	5.0
	8.6	7.6	6.2
	15.6	9.5	7.4
Quartzite	16.7	11.3	8.9
	4.3	3.6	2.6

Table 153. Provenience distribution, LA 14906

Provenience	Debitage	Tools	Cores	Points	Hammerstones	Total
Use Surfaces: F. 38 and area	576	29	7	3	4	620
F. 35 and area	134	6	2		1	145
F. 32 and area	68	3				74
F. 100-106	42	3	1			47
No Feature Association:		3	3	2	1	8
Totals	820	44	13	5	6	888

Table 154. Debitage reduction stage distribution by material, LA 14907

Material	Primary	Secondary	Tertiary	Angular Debris	Core Fragments	Total
Durable Materials: Rhyolite		1				1
Igneous		4			2	6
Quartzite	1					1
Brittle Material: Chert/chalcedony	4	4	1	1		10
Total	5	9	1	1	2	18

Table 155. Core type distribution by material, LA 14907

Core Type	Rhyolite	Igneous	Chert/ Chalcedony	Total
Single platform	1	2		3
Two adjacent		1		1
Two parallel			1	1
2 pairs of 2 adjacent		1	1	2
Totals	1	4	2	7

Table 156. Lithic artifact provenience distribution, LA 14907

Provenience	Debitage	Tools	Cores	Total
F. 20 and area	7	2	1	10
2-4 m south of F. 20	6	1		7
Trash north of F. 20	4		6	10
Strip Zone 6	1			1
Total	18	3	7	28

Table 157. Debitage reduction stage frequency by material, LA 14908

Material	Primary	Secondary	Tertiary	Angular Debris	Core Fragments	Totals	
						N	%
Durable: Rhyolite	13	71	16	10	9	119	54.8
Siltstone	1	9		2		12	5.5
Igneous	7	9		3		19	8.8
Quartzite	1	1		1		3	1.4
Brittle: Chert/chalcedony	7	24	3	21		55	25.3
Silicified wood		2	1	1		4	1.8
Obsidian	1		4			5	2.3
Total	30	116	24	38	9	217	99.9

Table 158. Debitage reduction stage percentages by material, LA 14908

Material	Primary	Secondary	Tertiary	Angular Debris	Core Fragments	Total
Durable: Rhyolite	11	60	13	8	8	100
Siltstone	8	75		17		100
Igneous	37	47		16		100
Quartzite	33	33		33		99
Brittle: Chert/chalcedony	13	44	5	38		100
Silicified wood		50	25	25		100
Obsidian	20		80			100

Table 159. Core type distribution by material, LA 14908

Core Type	Rhyolite	Siltstone	Igneous	Chert/ Chalcedony	Total
Single platform	1			2	3
Two parallel	1	1		1	3
Two adjacent	1		1		2
Two parallel, single	1				1

Three adjacent	1				1
Total	5	1	1	3	10

Table 160. Tool type distribution by material, LA 14908

Tool Type	Rhyolite	Siltstone	Igneous	Quartzite	Chert/ Chalcedony	Silicified Wood	Obsidian	Total
Shavers	6				1			7
Knives	7				3	1		11
Scrapers	14		2	1	3	2	1	23
Drill					1			1
Combination tools	2				1			3
Hoe	1		1					2
Indeterminate		1	1			1		3
Total	30	1	4	1	9	4	1	49

Table 161. Debitage reduction stage distribution by material, LA 14909

Material	Primary	Secondary	Tertiary	Angular Debris	Core Fragments	Total
Durable Materials: Rhyolite	6	30	2	1	3	42
Igneous	1	2				3
Quartzite		2				2
Siltstone	2	9		2	1	14
Brittle Materials: Chert/chalcedony	2	20	3	8		33
Silicified wood	1	4	1			6
Total	12	67	6	11	4	100

Table 162. Tool type distribution by material, LA 14909

Tool Type	Rhyolite	Quartzite	Chert/ Chalcedony	Total
Shavers			1	1
Knives	1			1

Tool Type	Rhyolite	Quartzite	Chert/ Chalcedony	Total
Scrapers	5		1	6
Notched scraper	1			1
Chopper		1		1
Indeterminate	2		2	4
Total	9	1	4	14

Table 163. Lithic artifact provenience distribution, LA 14909

Provenience	Debitage	Tools	Cores	Points	Total
Rooms: Features 8, 9, 11	12				12
Feature 15	2			1	3
Feature 16	1				1
Exterior Work Areas: Feature 10	2				2
Feature 17	8				8
Feature 7 and area	7	1	1		9
West Side Trash Areas: Area 1 (F. 1-3, 4-6 E)	5	2			7
Area 2 (F. 4-6, 4-6 E)	8	2		1	11
Area 3 (F. 1-3, 0-4 E)	27	4		1	32
Area 4 (F. 4-6, 0-4 E)	23	3		1	27
Outside Feature 15 (room)	1	1			2
Surface, no feature association	4	1	2		7
Totals	100	14	3	4	121

Table 164. Debitage reduction stage distribution by material, LA 14917

Material	Primary	Secondary	Angular Debris	Totals	
				N	%
Durable Materials: Rhyolite	1	8		9	69.2
Igneous			1	1	7.7

Brittle Materials: Chert/chalcedony	2		1	3	23.1
Total	3	8	2	13	100.0

Table 165. Debitage reduction stage distribution by material, LA 14920

Material	Primary	Secondary	Tertiary	Angular Debris	Core Fragments	Total	
						N	%
Durable Materials: Rhyolite	6	63	8	5	1	83	40.9
Igneous		4	7			11	5.4
Siltstone	1	16	2	1		20	9.8
Quartzite		2				2	1.0
Brittle Materials: Chert/chalcedony	9	39	19	12		79	38.9
Obsidian		3	5			8	3.9
Total	16	127	41	18	1	203	99.9

Table 166. Tool type distribution by material, LA 14920

Tool Type	Rhyolite	Siltstone	Chert/ Chalcedony	Total
Shavers	1		1	2
Knives	3		1	4
Scrapers	11		1	12
Drill		1		1
Combination tools	1		1	2
Facially reduced	1			1
Total	17	1	4	22

Table 167. Lithic artifact provenience distribution, LA 14920

Feature	Debitage	Tools	Cores	Points	Total
Surface				1	1
Feature 1	34	2			36
Feature 2	12	3			15

Feature 3	16				16
Feature 4	14				14
Feature 5	22	1			23
Feature 6	25	2			26
Feature 7	9				9
Feature 8	1				1
Isolated	70	15	3	1	89
Total	203	22	3	2	230

Table 168. Debitage reduction stage by material type, LA 14930

Material	Primary	Secondary	Tertiary	Angular Debris	Core Fragments	Total	
						N	%
Durable Materials: Rhyolite	7	48	3	2	1	61	15.1
Igneous	1	36	16	8		61	15.1
Siltstone	4	15		10	2	31	7.7
Brittle Materials: Chert/chalcedony	10	130	64	31		235	58.3
Obsidian		8	7			15	3.7
Total	22	237	90	51	3	403	99.9

Table 169. Tool type distribution by material, LA 14930

Tool Type	Siltstone	Chert/ Chalcedony	Total
Scrapers	1	2	3
Knife	1		1
Facially retouched		5	5
Total	2	7	9

Table 170. Taxa present at the Gallo project sites

Taxon (Common Name)	LA 5407	LA 6075	LA 6076	LA 14858	LA 14906	LA 14907	LA 14908	LA 14909	LA 14930
Sylvilagus sp. (cottontail)	X	X	X	X	X			X	
Lepus sp. (jackrabbit)	X	X	X	S	X		X	X	X

Taxon (Common Name)	LA 5407	LA 6075	LA 6076	LA 14858	LA 14906	LA 14907	LA 14908	LA 14909	LA 14930
Small sciurid	X	F	S					X	
Large sciurid	X	X	X	X				X	
Spermophilus variegatus (rock squirrel)		S							
Cynomys gunnisoni (prairie dog)		S		S				X	
Thomomys bottae (pocket gopher)	X	X	X	S	X		X	X	
Perognathus sp. (pocket mice)		F	F						
Dipodomys ordii (kangaroo rat)	X		F						
D. spectabilis (banner-tailed kangaroo rat)	X	F						X	
Cricetidae	X	F	F						
Peromyscus sp. (mice)	X	F	F						
Neotoma sp. (woodrats)	X	X	F		X			X	
Microtis sp. (voles)	X		F	S					
Small rodent	X	X	X						
Small-medium rodent	X								
Medium-large rodent	X	X	F	S					
Rodent	X	X	F						
Canis sp. (canids)	X		S						
Canis latrans (coyote)			S						
Canis familiaris (dog)	X								
Taxidea taxus (badger)			S						
Felis rufus (bobcat)	X								
Large felidae			S						
Carnivore	X		X						
Small carnivore	X								
Cervidae (deer or elk)	X								
Odocoileus hemionus (mule deer)	X		T	S				X	
O. virginianus (white-tailed deer)			S			X		X	
Odocoileus sp.					X				
Antilocapra americana (pronghorn)	X	S							
Bison bison (bison)	X								
Bos taurus (cow)			S						
cf. *Ovis canadensis* (mountain sheep)				S					
Ovis/Capra (domestic sheep/goat)			S						
Buteo sp. (hawk or eagle)							X		

Taxon (Common Name)	LA 5407	LA 6075	LA 6076	LA 14858	LA 14906	LA 14907	LA 14908	LA 14909	LA 14930
Corvus corvax (raven)	X								
Callipepla squamata (scaled quail)			S						
Meleagris gallopavo (turkey)	X		X					X	
Small bird	X	F	X						
Medium bird	X		F						
Large bird	X		S						
Bufo sp. (toads)	X								
Phyrosoma sp. (horned lizard)			F						
Herp (reptile or amphibian)	X		F						
Small mammal	X	X	X	X	X			X	
Small mammal or large bird	X	F	X					X	
Small-medium mammal	X	F	X		X				
Medium mammal	X		X						
Small-medium mammal or large bird	X		S						
Medium-large mammal	X	S	X	S	X		X		X
Large mammal	X	S	X	S	X		X	X	
Very large mammal	X			S	X	X			
Artiodactyl	X	S	S	S		X	X	X	
Unknown	X	X	F						
Small unknown		F	X						
Sample size (regular sample/flotation samples)	1013	139/ 377F	103/549F	56/ 70F	39	5	11	55	4
Egg shell			X						
% burned (regular sample/flotation)	17	16/19	22/56	11/94	10	10	27	5	75
% weathered (regular sample/flotation)	8	30/3	36/1	73/0	36	80	36	44	
% rounded	34		0/8		5				

S = regular sample only; F = flotation only; T = in tool assemblage only; X = present in both the regular and flotation sample

Table 171. Artiodactyl body parts

Site/Taxon	N	Skull	Axial	Rib	Limbs		Long Bone	Feet
					Front	Rear		
LA 5407 Cervidae	13	100.0*						
Odocoileus hemionus	8	12.5			37.5			50.0
Antilocapra americana	7	14.3			42.8			42.8
Bison bison	1							100.0
Artiodactyl	21	23.8		9.5	23.8	4.8	4.8	33.3
Large artiodactyl	5		40.0	20.0	20.0			20.0
Very large mammal	9		11.1				88.8	
LA 6075 *Antilocapra americana*	2							100.0
Artiodactyl	4	25.0						75.0
LA 6076 *O. virginianus*	3				66.7	33.3		
Ovis/Capra	1		100.0					
Bos taurus	1	100.0*						
Artiodactyl	4	25.0	50.0		25.0			
LA 14858 *Odocoileus hemionus*	2							100.0
cf. *Ovis canadensis*	1							100.0
Artiodactyl	1				100.0			
Large artiodactyl	1		100.0					
LA 14906 *Odocoileus* sp.	1	100.0						
Large artiodactyl	1							100.0
LA 14907 *O. virginianus*	1							100.0
Artiodactyl	1							100.0
Large artiodactyl	1						100.0	
LA 14908 Artiodactyl	1			100.0				
LA 14909 *Odocoileus hemionus*	3							100.0
O. virginianus	1							100.0
Artiodactyl	6				16.7	50.0	33.3	

* antler or horn

Table 172. Use of large mammal and artiodactyl bone for tools

Taxon	LA 5407	LA 6075	LA 6076	LA 14858	LA 14909
Cervidae	2				
O. hemionus	3		1		1
O. virginianus			1		
A. americana	1				
Artiodactyl	2		3	1	
Large mammal	6	1	2	1	
Total	14	1	7	2	1

Table 173. Main groups of animals as percentage of assemblage (n > 50)*

Taxon	LA 5407	LA 6075	LA 6076	LA 14858	LA 14909
Rabbits	20.6	43.1	32.0	53.6	52.7
Small mammal	17.6	10.5	4.8	5.4	1.8
Total rabbits and small mammal	38.2	53.6	36.8	59.0	54.5
Identified artiodactyl	1.6	1.4	2.9	5.4	7.2
Artiodactyl	2.1	2.9	3.9	1.8	10.9
Total artiodactyl	3.7	4.3	6.8	7.2	18.1
Large and very large mammal	18.4	3.6	3.9	5.4	3.6
Total artiodactyl and large mammal	22.1	7.9	10.7	12.6	21.7
Rodent	22.8	34.4	6.9	26.9	16.2
Carnivore/medium mammal	1.8		11.8		
Bird	1.6		5.8		3.6
Sample size	1013	139	103	56	55

* Does not include flotation bone, antler, modern artiodactyl taxa, or dog remains

Table 174. Analysis of botanical materials

Site	Description	Location	Flotation			Macrobotanical		
			Full	Scan	Wood	Cultivars	Wild Taxa	Wood
EARLY PITHOUSE: LA 5407	pit structure, exterior features	terrace, 200 m from Largo Creek, 2224 m elevation	6	12	7	corn, beans, cucurbits	walnut, piñon, yucca, reedgrass, weed seeds	x
LA 14906	open shallow site, many hearths	low terrace, 1220 m from Largo Creek, 2215 m elevation	1	3	0			
EARLY PUEBLO: LA 6075	pit structure, 4 rooms	ridge, 275 m from Largo Creek, 2230 m elevation	0	13	0			
LA 6076	1-2 pit structures, 10 rooms	side of high ridge, 260 m from Largo Creek, 2213 m elevation	0	21	0	corn	piñon	
LA 14858	pit structure, room block	hill slope, 200 m from Largo Creek, 2217 m elevation	6	0	4			
LA 14907	2 room fieldhouse	low knoll, 500 m from Largo Creek, 2216 m elevation	1	0	0			
LA 14909	2-4 room structure	base of hill, 150 m from Largo Creek, 2225 m elevation	3	0	2	corn	conifer	
LA 14917							ground cherry	
TOTAL SAMPLES:			18	47	13			

Macrobotanical wood analyzed by Michael Diehl

Table 175. Full-sort flotation results, LA 5407

Taxa	Fea.25	Fea. 39 Pit Structure				
	Antechamber	Hearth	Floor SW Quad	Floor SE Quad	Floor NE Quad	Floor SE Quad
	FS 25-186	FS 39-702	FS 39-804	FS 39-805	FS 39-809	FS 39-817
PROBABLE ECONOMICS: Weedy Annuals *Chenopodium* (goosefoot)	409/1636*	33/660*	72/267*		59/268*	
Cycloloma (winged pigweed)			36/84*	922/26871*	12/48*	
Physalis (groundcherry)				1/20*		
Portulaca (purslane)				2/40*	1/4*	
Unidentifiable		2/40*	9/36*	4/80*		
Grasses, Gramineae (grass family)				Culm with node*		
Perennials *Juniperus* (juniper)			Twig*	Twig*	Twig*	Twig*
Pinus edulis (piñon)	Needles*	1/1* Needles*				
Pinus sp. (pine)	Bark*					
Cultivars *Cucurbita* (squash)				Rind*		
Phaseolus vulgaris (common bean)					2/2*	1/1*
Zea mays (corn)	4/4* cupule*	12/32* cupules* cob fragment*	61/61* cupules* cob fragment*	8/8* cupules*	126/126* cupules* cob fragment*	220/220* cupules* cob fragment*
TOTAL PROBABLE ECONOMICS: Total seeds	414/1644	48/733	178/448	937/27019	200/408	221/221
Total taxa	3	4	5	6	6	3

Taxa	Fea.25	Fea. 39 Pit Structure				
	Antechamber	Hearth	Floor SW Quad	Floor SE Quad	Floor NE Quad	Floor SE Quad
	FS 25-186	FS 39-702	FS 39-804	FS 39-805	FS 39-809	FS 39-817
TAXA WITH UNCERTAIN ROLE: *Amaranthus* (pigweed)	1/4					
Chenopodium (goosefoot)						19/76
Cycloloma (winged pigweed)						2/8
Heliantheae (sunflower)		1/ 1				
Physalis (groundcherry)	1/4					
Portulaca (purslane)		1/20				2/8
Sporobolus (dropseed grass)		1/20				
TAXA WITH UNCERTAIN ROLE: Total seeds Total taxa	2/8 2	3/41 3				21/84 2

a/b: number before slash is actual number of seeds recovered; number after slash indicates estimated number of seeds per liter of soil, taking into account both subsampling and soil sample volumes other than the standard 1.0 liter
*some or all specimens carbonized

Table 176. Flotation scan results, storage pits and pit structure fill, LA 5407

Taxa	Fea. 30 Storage Pit FS 30-8	Fea. 32 Storage Pit FS 32-13	Fea. 39, East Half Pit Structure Fill FS 39-156
PROBABLE ECONOMIC SPECIES: *Phragmites* (common reed)			culm*
Cucurbita (squash)	+		rind*
Zea mays (corn)	cupules+*		+++* cupules+*
TOTAL ECONOMIC TAXA:	2	0	3
TAXA WITH UNCERTAIN ROLE: *Chenopodium* (goosefoot)	+++	+++	
Compositae (sunflower family)	+		
Cycloloma (winged pigweed)	+		
Physalis (groundcherry)	+		
TOTAL UNCERTAIN TAXA:	4	1	0

* some or all specimens carbonized

Table 177. Flotation scan results, vessel contents, LA 5407

Taxa	Vessel 12 FS 39-786	Vessel 5 FS 39-789	Vessel 3 FS 39-792	Vessel 13 FS 39-794	Vessel 7 FS 39-795	Vessel 2 FS 39-799	Basket Bb FS 39-806	Basket Bf FS 39-821	Basket FS 39-810
PROBABLE ECONOMIC SPECIES: *Chenopodium* (goosefoot)		+++*	+*					+*	
Cycloloma (winged pigweed)								+*	
Helianthus (sunflower)								+++*	
Pinus edulis (piñon)		+*							
Phaseolus (bean)					+*				
Zea mays (corn kernels, cob fragments)	+*	++*	++*	+*	+* ++*	+* +*	+++* +*	++* +*	+*
TOTAL ECONOMIC TAXA	1	3	2	1	2	1	1		1
TAXA WITH UNCERTAIN ROLE: *Chenopodium* (goosefoot)	+				+				
Compositae (sunflower family)							+		
Portulaca (purslane)							+		

* some or all carbonized
\+ 1-10 items
++ 11-25 items
+++ >25 items

Table 178. Basket remains and food contents by quad, Feature 39, LA 5407

Quad	Basket Number	Baskets FS 39-	Contents FS 39-	Level	Horizontal Location
NE	Bf	779	822 sunflower seeds corn kernels	Floor	30°; 280-300 cm DC
			249 piñon nuts	Floor	80°; 50 cm DC
		502		?	Outer zone
		503		General fill	
SE		22		Floor	13-14 m E, 19-22 m N
	Ba	175		?	130-140°; 240-260 cm DC
		295		Floor	133°; 250 cm DC

Quad	Basket Number	Baskets FS 39-	Contents FS 39-	Level	Horizontal Location
		495		Roof	130-135°; 360-380 cm DC
	Bb	785		Floor	160°; 285 cm DC
			806 corn kernels	Floor	164°; 310 cm DC
		776		Floor	165°; 50 cm DC
	Bc		306 cucurbit seed	?	180°; 50 cm DC
		458	458 corn kernels	Floor	180°; 40-75 cm DC
			574, 803 loose corn kernels and fused masses		180°; 50 cm DC
		776		Floor	180°; 40-75 cm DC
		506		Floor	outer zone
			810 (few corn cupules)	?	wall edge
		678		Floor	inner zone
SW		509		Floor	
		776		Floor	210°; 50 cm DC
	Bd	575		Floor	250°; 420 cm DC
		782		Floor	255°; 410 cm DC
		598		Floor	260°; 420 cm DC
		677		Floor	?
NW	Be	579		Floor	350-360°; 270 cm DC
		835		Floor	?

Shading indicates major concentrations of fragmentary basket remains, given a designation (e.g., Ba) to signify a probable single basket.

Table 179. Contents by vessel type, form, and size, LA 5407

Vessel Type, Form, and Size	Vessel No.	Principal Contents		
		Corn Kernels	Beans	Annuals
JAR FORMS: Ceramic vessels Small	V 1			+ *Helianthus* achenes
	V 12	+		
	V a	+		
Medium	V 2	+		
	V 3	+		

	V 4	+		
Large	V 5			+ *Chenopodium* seeds
	V 7		+	
	V 8	+		+ *Cycloloma* seeds
	V 10	+		
	V 13	+		
	V 14	+		
	V b	+		
Cucurbit container[1]	C a			+ *Chenopodium*, *Amaranthus* seeds
BOWL FORMS: Ceramic vessels Large basketliners	V 6	+		
	V 9			
Large bowl	V 11			
Baskets[2]	B b	+		
	B c	+		
	B f	+		+ *Helianthus* achenes
TOTAL		10 jar forms (all sizes), 2 bowls	1 large jar	4 jar forms (all sizes), 1 bowl form

[1]presumed small-medium jar form
[2]all presumed to be bowl forms or flat; size is generally unknown (B c is large)

Table 180. Distribution of carbonized macrobotanical and flotation remains by provenience and taxon, pit structure and antechamber, LA 5407

Provenience	NE Quad	SE Quad	SW Quad	NW Quad	Antechamber
Floor/fill	F 39-809	F 39-805,-817	F 39-804		F 25-186
Vessels	V 1,2,3,4,5,6 V 12, a; B f	V 7,8 B a,b,c; C a	V 9 B d	V 10,11,13,14 B e	V b
Features		Footdrum	Footdrum Storage pits	Hearth Entrance	Storage pit
Weedy Annuals: goosefoot	Floor V 3, V 5	C a	Floor	Hearth	Floor
pigweed		C a			
beeweed		Floor			
winged pigweed	Floor	Floor V 8	Floor		
sunflower	V1				
groundcherry		Floor			

Provenience	NE Quad	SE Quad	SW Quad	NW Quad	Antechamber
Floor/fill	F 39-809	F 39-805,-817	F 39-804		F 25-186
Vessels	V 1,2,3,4,5,6 V 12, a; B f	V 7,8 B a,b,c; C a	V 9 B d	V 10,11,13,14 B e	V b
Features		Footdrum	Footdrum Storage pits	Hearth Entrance	Storage pit
purslane	Floor	Floor			
Reedgrass:	V a, V 4, V 6	Floor V 8			V b
Perennials: walnut	Floor	Floor	Floor	Floor	Floor
juniper	Floor	Floor	Floor		
piñon nut	Floor, V 5, fill of unknown basket	Floor	Floor	Hearth	Floor
piñon needles				Hearth	Floor
pine bark					Floor
Cultivars: corn kernels	Floor V 2, V 3, V 5, V 6, V 12	Floor V 7; B b, B c	Floor	Floor Hearth; V 10, V 13	Floor Storage pit
corncob fragments	Floor V 2	Floor V 7, B b	Floor	Floor Hearth	Floor Storage pit
beans	Floor V 6	Floor V 7			Storage pit
squash rind	Floor	Floor C a	Floor		
squash seeds		B c	Floor		
Total taxa	11	12	7	4	6

Ceramic vessels [V] include those numbered 1-13 during 1977 excavations, and others given an alphabetic designation during current studies: V a [FS 39-20]; V b [FS 25-244]. Baskets [B] were given alphabetic designations in the current study: B a [FS 39-175, -295], B b [FS 39-785, -806], B c [FS 39-306, -458, -574, -776], B d [FS 39-575, -598, -782], B e [FS 39-579]; as was a cucurbit container C a [FS 39-668].

Table 181. Distributions of corn kernels and cobs by context, LA 5407

Quadrant	Northeast	Northwest	Southeast	Southwest	Total
Floor fill	781 kernels, 55 cobs	3 kernels, 65 cobs	283 kernels, 67 cobs	61 kernels	1128 kernels, 187 cobs
General fill	19 cobs	28 cobs	22 cobs	6 cobs	75 cobs
Posthole	-	-	-	1 cob	1 cob
Outer Zone	-	-	-	1 cob	1 cob

Vessels	9731+ kernels	41+ kernels	70+ kernels	-	9842+ kernels
Total	10512+ kernels, 74 cobs	44+ kernels, 93 cobs	353+ kernels, 89 cobs	61 kernels, 8 cobs	10970 kernels, 264 cobs

Table 181 (continued)

	NE Quad		SE Quad		SW Quad		NW Quad		Antechamber	
	Floor and fill	Vessels	Floor and fill	Vessels	Floor and fill	Vessels	Floor and fill	Vessels	Floor and fill	Vessels
Cobs	74	-	89	-	8	-	93	-	-	-
Kernels	781	[9371]	283	[70]	61	-	3	[41]	112	[1100]

Figures in brackets required calculation of estimated numbers from weights.

Table 182. Species composition of charcoal from flotation samples, LA 5407

Taxa	FS 25-186 Fea. 25 Floor Fill	FS 30-8 Fea.. 30 Storage Pit	FS 39-702 Fea.. 39 Hearth	FS 39-804 Fea. 39 Floor SW	FS 39-805 and 39-817 Fea.39 Floor SE	FS 39-809 Fea.39 Floor NE	TOTAL
CONIFERS: *Juniperus* (juniper)	1 0.1 g	19 0.6 g	18 1.1 g	11 0.4 g	5 0.1 g	6 0.2 g	60/ 43% 2.5/ 46%
Pinus edulis (piñon)		1 <0.05 g	2 0.2 g	1 <0.05 g	1 0.1 g		5/ 4% 0.3/ 6%
Pinus ponderosa (ponderosa)							
Undetermined				8 0.2 g	1 <0.05 g		9/ 6% 0.2/ 4%
Total Conifer	1 0.1 g	20 0.6 g	20 1.3 g	20 0.6 g	7 0.2 g	6 0.2 g	74/ 53% 3.0/ 56%
NONCONIFERS: *Atriplex/ Sarcobatus* (saltbush/ greasewood)	1 0.1 g						1/ 1% 0.1/ 1%
Populus/Salix (cottonwood/ willow)	17 0.7 g				26 0.9 g	11 0.4 g	54/ 39% 2.0/ 37%
Undetermined nonconifer	1 0.1 g				7 0.1 g	3 0.1 g	10/ 7% 0.3/ 6%
Total Nonconifers	19 0.9 g				33 1.0 g	14 0.5 g	65/ 47% 2.4/ 44%
TOTAL SAMPLE pieces weight	20 1.0 g	20 0.6 g	20 1.3 g	20 0.6 g	40 1.2 g	20 0.7 g	140/100% 5.4/100%

Table 183. Distribution of macrobotanical wood by context, LA 5407

Taxon	Floor Fill	General Fill	Extramural Pit	Posthole Fill	Vessel Contents	TOTAL
CONIFERS: *Juniperus* (juniper)	3/.2	13/2.6	21/.5	50/4.8; 52/9.3u	35/5.4	122/13.5
Pinus (pine)	3/1.0	6/3.9	3/.1	8/1.5	6/2.1	26/8.6
Pinus edulis (piñon)	5/.4	37/11.0; 4/2.3u	2/.1	96/27.8; 99/22.5u	37/10.0	177/49.3; 103/24.8u
Undetermined				3/0.0; 4/.4u	59/4.5	62/4.5; 4/.4u
Total Conifer	11/1.6	56/17.5; 4/2.3u	26/.7	157/34.1; 155/36.2u	137/ 22.03	387/75.9; 159/38.5u
NONCONIFERS: *Cercocarpus* (mountain mahogany)					23/9.7	23/9.7
Populus/Salix (cottonwood/willow)	21/2.5	49/3.9			262/ 52.8	332/59.1
Quercus Oak		15/2.4			24/13.9	39/16.3
Solanaceae					1/.4	1/.4
Undetermined		1/0.0		1/0.0		2/0.0
Unknown				1/0.0	1/.06	2/.06
Total Nonconifers	21/2.5	65/6.3		2/0.0	311/ 76.8	399/85.6
Phragmites (common reed)	½	5/6	0/1	2/14	6/9	14/32

All data derived from analyses completed by M. Diehl 1995.
Key: number of pieces/ weight in grams; u = uncharred; presence of *Phragmites*: number of samples containing *Phragmites*/ total number of samples.

Samples included in provenience categories:
Floor Fill: FS 25-186, 25-204
General Fill: FS 39-115, 39-176, 39-177, 39-180, 39-546, 39-709
Pit Fill: FS 33-3
Posthole Fill: FS 25-187, 25-199, 25-209, 25-210, 25-211, 25-212, 25-213, 25-214, 25-217, 25-218, 25-219, 25-222, 39-129, 39-141
Vessel Contents: FS 39-20, 25-244, 39-150

Table 184. Flotation scan and full-sort results, LA 14906

Taxa	Scan			Full-Sort
	FS 7-30 Fea. Hearth	FS 8-36	FS 34-1	FS 8-44 Fea. 8 Hearth
WEEDY ANNUALS: *Chenopodium* (goosefoot)		++*		
PERENNIALS: *Juniperus* (juniper)	tw+++*		tw+++*	tw+++*
Pinus edulis (piñon pine)				n+*
TOTAL PROBABLE ECONOMIC SPECIES: Total taxa	1	1	1	2
Total burned taxa	1	1	1	2
TAXA WITH UNCERTAIN ROLE: *Chenopodium* (goosefoot)	+		+	14/50
Amaranthus (pigweed)			+	1/ 4
Portulaca (purslane)				1/ 4
Juniperus (juniper)		tw		
Pinus edulis (piñon pine)		+		
TOTAL UNCERTAINS:	1	2	2	16/58
PROBABLE CONTAMINANTS: *Euphorbia* (spurge)	0	0	0	2/ 8

+ 1-10 items; ++ 11-25 items; +++ more than 25
* = some or all items burned; n = needle; tw = twig

Table 185. Flotation scan results, pit structure floor (Feature 16), LA 6075

Taxa	FS 161 Grid 32	FS 162 Grid 14	FS 164 Grid 25	FS 165 Grid 24	FS 172 Grid 26	FS 184 Grid 22	FS 187 Grid 4	FS 189 Grid 13
TAXA WITH UNCERTAIN ROLE: *Chenopodium* (goosefoot)						+		
Juniperus (juniper)		tw						
Pinus edulis (piñon)	n	n	n					
TOTAL UNCERTAINS:	1	2	1	0	0	0	0	0
PROBABLE CONTAMINANTS: Gramineae (grass family)				+		+		

\+ 1-10 items; ++ 11-25 items; +++ more than 25
* some or all items burned
tw twig; n needle

Table 186. Flotation scan results, pit structure hearth (Feature 16) and cobble/jacal rooms (Features 26, 27, 28), LA 6075

Taxa	FS 16-208 Hearth	Rooms			
		FS 26-13	FS 27-1 Floor	FS 27-2 Hearth	FS 28-6 Floor
WEEDY ANNUALS: *Chenopodium* (goosefoot)		+++*			
Cycloloma (winged pigweed)	+*				
Nicotiana (tobacco)		+			
PERENNIALS: *Juniperus* (juniper)			tw+*		
Pinus edulis piñon pine			n+*		
Rhus squawberry	+*				
TOTAL PROBABLE ECONOMIC SPECIES: Total taxa		2	2	0	
Total burned taxa		1	2	0	

Taxa	FS 16-208 Hearth	Rooms			
		FS 26-13	FS 27-1 Floor	FS 27-2 Hearth	FS 28-6 Floor
TAXA WITH UNCERTAIN ROLE: *Chenopodium* (goosefoot)	+		+	+	+
Amaranthus (pigweed)			+		+
Portulaca (purslane)					+
Juniperus (juniper)			+	co	tw, co
Pinus edulis (piñon)				n	n
TOTAL UNCERTAINS:	1	0	2	3	5

+ 1-10 seeds; ++ 11-25 seeds; +++ more than 25
* some or all items burned
tw = twig; n = needle; co = cone

Table 187. Flotation scan results, main occupation pit structure (Feature 28)) and rooms (Features 29 and 35), LA 6076

Taxa	Main Occupation Pit Structure (Floor Fill)			Main Occupation Rooms				
				Floor fill		Ash Pit	Hearth	Floor fill
	FS 28-67	FS 28-68	FS 28-70	FS 29-50	FS 29-68	FS 29-72	FS 35-30	FS 35-31
PERENNIALS: *Opuntia* (pricklypear cactus)				+*				
Yucca (yucca)				+*				
Juniperus (juniper)	tw+*			tw+*				
Pinus edulis (piñon pine)			cs+*				cs+* n+*	
Pinus sp. (pine)	b+*		b+*	b+*	b+*	b+*		b+*
CULTIVARS: *Zea mays* (corn)			k+* c+*		c+*	c+*		
TOTAL PROBABLE ECONOMIC SPECIES: Total taxa	2	0	2	4	2	2	1	1
Total burned taxa	2	0	2	4	2	2	1	1
TAXA WITH UNCERTAIN ROLE: *Chenopodium* (goosefoot)				+				
Amaranthus (pigweed)				+				
Portulaca (purslane)								
Cycloloma (winged pigweed)				+				
TOTAL UNCERTAINS:	0	0	0	3	0	0		

+ 1-10 items; ++ 11-25 items; +++ more than 25
* some or all items burned; c = cupule; k = kernel; tw = twig; b = bark; cs = cone scale; n = needle

Table 188. Flotation scan results, main occupation room (Feature 41/57) and earlier pit structure (Feature 59), LA 6076

Taxa	Main Occupation Room		Earlier Pit Structure					
	Fill	Storage Pit	Floor Fill		Cists		Ash Pit	Hearth
	FS 41-14	FS 57-7	FS 59-19	FS 59-25	FS 59-59	FS 59-60	FS 59-67	FS 59-79
PROBABLE ECONOMIC SPECIES: *Cleome* (beeweed)			+*	++*				
Juniperus (juniper)					tw+*			
TOTAL PROBABLE ECONOMIC SPECIES: Total taxa	0	0	1	1	1	0	0	0
Total burned taxa	0	0	1	1	1	0	0	0
TAXA WITH UNCERTAIN ROLE: *Chenopodium* (goosefoot)		+	++	++	+++	++	+++	
Amaranthus (pigweed)		+			++	+		
Portulaca (purslane)					+			
Oryzopsis (ricegrass)		+						
TOTAL UNCERTAINS:	0	3	1	1	3	2	1	0

+ 1-10 items; ++ 11-25 items; +++ more than 25
* some or all items burned; c = cupule; k = kernel; tw = twig; b = bark

Table 189. Flotation scan results, earlier room (Feature 60) and extramural storage pit (Feature 56), LA 6076

Taxa	Earlier Room				Extramural Storage Pit
	Floor Fill		Hearths		
	FS 60-52	FS 60-56	FS 60-57	FS 60-58	FS 56-1
WEEDY ANNUALS: *Cleome* (beeweed)	+*	++*	+*	++*	
Yucca (yucca)					
Juniperus (juniper)	tw+*		tw+*	tw++*	
CULTIVARS: *Zea mays* (corn)			c++*	c++*	

Taxa	Earlier Room				Extramural Storage Pit
	Floor Fill		Hearths		
TOTAL PROBABLE ECONOMIC SPECIES: Total taxa	2	1	3	3	0
Total burned taxa	2	1	3	3	0
TAXA WITH UNCERTAIN ROLE: *Chenopodium* (goosefoot)	+++	+++	+		
Amaranthus (pigweed)		+			
TOTAL UNCERTAINS:	1	2	1	0	0

+ 1-10 items; ++ 11-25 items; +++ more than 25
* some or all items burned; c = cupule; tw = twig

Table 190. Distribution of corn remains at LA 6076 and LA 14909

Site	Fill		Floor Fill and Floor Contact		Hearths		Pits		Total Count	Total Weight
	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight
LA 6076	FS 60-81 [1C]	1.3	FS 28-70 [1F] FS 29-68,-72 [2F] FS 41-2A,-23,-24 [8C] FS 57-2 [1C] FS 58-5,-19 [2C] FS 60-47 [1C]	10.0	FS 60-57,-58 [2F] FS 60-61 [4C]	3.5	FS 60-59,-60 [3C]	5.2	[20C] [5F]	20.0
LA 14909	FS 16-6, -10 [2C] FS 16-12 [1F]	1.2	FS 15-19 [1F]						[2C] [2F]	1.2
TOTAL	[3C] [1F]	2.5	[12C] [4F]	10.0	[4C] [2F]	3.5	[3C]	5.2	[22C] [7F]	21.2

All macroremains in this table consist of measurable cob fragments (unmeasurable fragments were also present).
#C = number of measurable cob fragments recovered; #F = number of flotation samples with corn remains. Weights are of measurable cobs are expressed in grams.

Table 191. Flotation full-sort results, LA 14858

Taxa	Masonry Rooms		Jacal Room		Pit Structure	
	Hearth FS 6-25	Floor FS 8-11	Hearth FS 15-9	Ash Pit FS 15-10	Hearth FS 16-19	Hearth FS 16-20
PROBABLE ECONOMIC SPECIES: *Chenopodium* (goosefoot)					1/1*	4/4*
Pinus sp. (pine)		b+++*				
Pinus edulis (piñon)	1/ 1* cs*					
Yucca baccata (yucca)				1/1*		
Zea mays (corn)		c*	c*			
TOTAL PROBABLE ECONOMICS:						
Total seeds	1/ 1	0	0	1/1	1/1	4/4
Total taxa	1	2	1	1	1	1
TAXA WITH UNCERTAIN ROLE: *Chenopodium* (goosefoot)	9/90	6/24	1/10	3/3		
Compositae (sunflower family)			1/ 4			
Juniperus (juniper)				tw		

+ 1-10 items; ++ 11-25 items; +++ more than 25
a/b: number before slash is actual number of seeds recovered; number after slash indicates estimated number of seeds per liter of soil, taking into account both subsampling and soil sample volumes other than the standard 1.0 liter
* some or all specimens carbonized
c = cupule; tw = twig; b = bark; cs = cone scale

Table 192. Species composition of charcoal from flotation samples, LA 14858

Taxa	Masonry Room	Jacal Room		Pit Structure	TOTAL	TOTAL %
	Hearth FS 6-25	Hearth FS 15-9	Ash Pit FS 15-10	Hearth FS 16-19		
CONIFERS: *Juniperus* (juniper)	16 0.4 g	16 0.6 g	14 0.4 g	4 0.2 g	50 1.6 g	62 43

Taxa	Masonry Room	Jacal Room		Pit Structure	TOTAL	TOTAL %
	Hearth FS 6-25	Hearth FS 15-9	Ash Pit FS 15-10	Hearth FS 16-19		
Pinus edulis (piñon)	2 0.1 g		1 0.1 g	4 0.3 g	7 0.5 g	9 13
Undetermined	2 0.1 g	3 0.2 g	5 0.4 g	12 0.8 g	22 1.5 g	28 41
Total Conifer	20 0.6 g	19 0.8 g	20 0.9 g	20 1.3 g	79 3.6 g	99 97
Undetermined nonconifer		1 0.1 g				
TOTAL SAMPLE	20 0.6 g	20 0.9 g	20 0.9 g	20 1.3 g	80 3.7 g	100 100

Table 193. Flotation full-sort results, LA 14907 and LA 14909

Taxa	LA 14907	LA 14909		
	FS 21-3 Hearth	FS 15-19 Fea. 15 Floor	FS 16-11 Fea. 16, Room Level 8, Ash	FS 16-12 Fea. 16, Room Level 16
WEEDY ANNUALS: *Chenopodium* (goosefoot)		4/16*		8/32*
Unidentifiable				1/1*
PERENNIALS: *Juniperus* (juniper)				tw+*
Pinus edulis (piñon pine)		n+*		
CULTIVARS: *Zea mays* (corn)		c+*		c+* 2/2k*
Phaseolus (bean)				[1/1*]
TOTAL PROBABLE ECONOMIC SPECIES: Total taxa Total burned taxa	 0 0	 3 3	 0 0	 3 3
Total seeds	0	4/16	0	12/36
TAXA WITH UNCERTAIN ROLE: *Chenopodium* (goosefoot)	1/1			

Taxa	LA 14907	LA 14909		
	FS 21-3 Hearth	FS 15-19 Fea. 15 Floor	FS 16-11 Fea. 16, Room Level 8, Ash	FS 16-12 Fea. 16, Room Level 16
Juniperus (juniper)	tw+ ♂ cone			
Pinus edulis (piñon)	n+			
TOTAL UNCERTAINS: Taxa Seeds	3 1/1	0 0	0 0	0 0

+ 1-10 items; ++ 11-25 items; +++ more than 25
* some or all items burned; c = cupule; k = kernel; tw = twig; b = bark; cs = cone scale; n = needle

Table 194. Species composition of charcoal from flotation samples, LA 14909

Taxa	FS 15-19 Fea.15 Floor	FS 16-12 Fea. 16, Room Level 8, Ash	TOTAL	
			Pieces	Weight
CONIFERS: *Juniperus* (juniper)	19 0.4 g	9 0.3 g	28 70%	0.7 g 55%
Pinus edulis (piñon)	1 <0.05 g	2 0.1 g	3 7%	0.1 g 7%
Undetermined conifer		7 0.4 g	7 18%	0.4 g 31%
Total Conifer	20 0.4 g	18 0.8 g	38 95%	1.2 g 93%
NON-CONIFERS: *Populus/Salix* (cottonwood/willow)		2 0.1 g	2 5%	0.1 g 7%
TOTAL	20 0.4 g	20 0.9 g	40 100%	1.3 g 100%

Table 195. Number and patterning of corncob rows: Gallo sites in a regional context

Site	N	% 4, 6, or 8-rowed	% 10-rowed	% 12-rowed	% 14, 16 or 18-rowed	% with Irregular or Undeveloped Rows
Preceramic: Tularosa Cave[1]	1007	9	16	43	32	-
Early Pithouse Period: LA 5407	148	9	20	52	19	38
Tularosa Cave[1]	389	10	21	44	25	-
Late Pithouse Period: O-Block Cave[2]	136	52	29	12	7	-
Tularosa Cave[1]	2106	44	23	23	10	-
Early Pueblo Period: LA 6076 and LA 14909	22	32	45	23	0	18
O-Block Cave[2]	59	46	27	17	10	-
Late Pithouse-Late Pueblo: Tularosa Cave[1]	208	72	22	4	2	-
Early-Late Pueblo: Carter Ranch[3]	351	24	41	31	4	-
Late Pueblo: Higgins Flat[4]	80		Avg. row # = 10.5			
TOTAL	4358	289	244	249	109	56

[1] Cutler 1952:468
[2] Cutler and Meyer 1965:42
[3] Cutler 1964:230
[4] Cutler 1956:179

Table 196. Corn cob morphometrics: Gallo sites by chronological period

Site	Specimens with Intact Glumes			Specimens Partially Eroded			Specimens with No Glumes		
	Cob Diameter	Glume Width	RSL	Cob Diameter	Cupule Width	RSL	Rachis Diameter	Cupule Width	Cupule Height
Early Pithouse Period: LA 5407	15.1 [99]	6.8 [99]	3.6 [99]	14.1 [48]	6.8 [48]	3.8 [48]	7.7 [1]	4.4 [1]	2.8 [1]
Early Pueblo Period: LA 6076 and LA 14909	13.2 [5]	7.5 [5]	3.8 [5]	11.8 [17]	7.1 [17]	3.9 [17]	-	-	-
TOTAL	28.3 [104]	14.3 [104]	7.4 [104]	25.9 [65]	13.9 [65]	7.7 [65]	7.7 [1]	4.4 [1]	2.8 [1]

Table 197. Corn kernel morphometrics at LA 5407: Effects of swelling and absence of embryos

Attribute	Total Kernels	Effect of Swelling		Effect of Embryo Presence	
		Not Swollen	Swollen	With Embryo	Lacking Embryo
N	368	211	157	245	123
Length	7.2	7.3	7.3	7.4	7.0
Width	7.3	7.0	7.5	7.3	7.2
Thickness	5.2	5.1	5.5	5.2	5.3

Measurements are actual (no adjustment to estimate size before carbonization) and expressed as a mean value in mm.

Table 198. Corn kernel morphometrics: LA 5407 in a regional context

Site	N	Length	Width	Thickness
Early Pithouse Period: LA 5407	368	7.2	7.3	5.2
Late Pueblo Period: Higgins Flat* Higgins Flat~	 80 481			 Avg. = 4.7 Avg. = 4.2
TOTAL:	929	7.2	7.3	5.2

Note: Higgins Flat data taken from Cutler 1956:179
* Total average thickness derived from direct measurements of 481 kernels.
~ Total average thickness derived from rachis segment lengths measured by Cutler for each cob examined divided by the total number of cobs examined.

Table 199. Morphometrics of Early Pithouse charred beans (*Phaseolus vulgaris*), LA 5407

Dimension	Mean (mm)	Coefficient of Variation	Number of specimens	Range (mm)
Length	11.5	.133	51	5.6-13.9
Width	7.0	.127	52	4.3- 8.8
Thickness	5.6	.171	31	2.1- 6.8
Thickness (single cotyledons)	3.1	.125	20	2.5- 3.8

Specimens from:
25-132, storage pit, n = 1
39-194, 39-255, 39-809, floor, NE, n = 8
39-670, n= 1
39-795, Vessel 7, n =41
39-817, floor, SE, n = 1

Table 200. Carbonized *Cucurbita* (squash/pumpkin) exocarp, Feature 39, LA 5407

Quad	FS	N	Weight (g)	Thickness	
				Mean (mm)	Range (mm)
SW	181	5	.02	2.1	1.7-2.3
	184	11	.21	1.6	1.3-2.0
	254	3	.21	2.2	2.0-2.5
	666	6	.12	2.2	1.3-2.6
SE	295	2	.20	2.8	1.9-3.6
	305	4	.11	2.5	2.0-3.1
	444	31	.97	2.4 [cv .235]	1.5-3.6
	449	15	.91	3.3	2.9-4.5
	451	15	1.49	3.6	2.9-4.5
	668	41	1.99	2.5 [cv .191]	2.0-3.9
NE	448	24	.75	1.7	1.1-3.1
	508	1	.05	2.2	2.2
	569	20	.54	1.8	1.3-2.1
	665	7	.11	1.9	1.1-3.0
TOTAL		185	7.68		1.1-4.5

Table 201. Charred *Lagenaria* (bottlegourd) exocarp, Feature 39, LA 5407

Quad	FS	N	Weight (g)	Thickness	
				Mean (mm)	Range (mm)
SW	666	3	.09	2.2	2.2-2.3

Table 202. Comparative cucurbit rind assemblages

Site	N	*Cucurbita*			*Lagenaria*		
		% Pieces	% Weight	Mean Thickness, Range (mm)	% Pieces	% Weight	Mean Thickness (mm)
Gallo [LA 5407]	188 7.77 g	98	99	2.3 1.1-4.5 cv .328	2	1	2.2 2.2-2.3 --

Chaco: Pueblo Bonito[1]	561 353.1 g	98	99	2.2 0.4-5.6 cv .365	2	1	2.0 1.2-3.9 cv .421
Bis sa 'ani[2]	29	93	-	1.3 0.6-2.2	7	-	-
Historic Zuni: Yamutewa[3]	21 38.0 g	81	87	2.9 1.5-4.7 cv .300	19	13	2.6 1.9-3.2 cv .206
Hopi: Walpi[4]	91	68	-		32		
Canyon de Chelly: Antelope House[5]	6344	97	-		3	-	
Sliding Rock[6]	124 31.5 g	92	94	2.2	8	6	2.0
Mesa Verde: Step House, Long House, Mug House, and other sites[7]	2109	98			2		

[1]Original data in possession of the author. Specimens collected by George Pepper (Hyde Expedition, 1896-1900), stored at the American Museum of Natural History, and analyzed by M. S. Toll (1985).
[2]Donaldson and Toll 1982
[3]Toll 1987. Ceremonial rattles made of *Lagenaria* may skew assemblage in direction of bottlegourd.
[4]Gasser 1981:80-84. All large concentrations of *Lagenaria* were recovered from storage, religious, or religious storage rooms.
[5]Hall and Dennis 1986:132; Table 45
[6]Toll 1980
[7]Cutler and Meyer 1965:151-152; Tables 1-4

Table 203. Charred cucurbit seeds, floor fill, Feature 39, southwest quad, LA 5407

FS	Height (mm)	Width (mm)
289	10.8	5.8
306	12.1	5.4
507	12.5	7.3

Table 204. Gallo nonwood floral remains by period and site

	Early Pithouse		Early Pueblo				
	LA 5407	LA 14906	LA 6075	LA 6076	LA 14858	LA 14907	LA 14909
Annuals: goosefoot	+	+	+		+		+
pigweed	+						
beeweed	+			+			
sunflower	+						
winged pigweed	+		+				
groundcherry	+						

purslane	+						
tobacco			+				
Perennials: pricklypear				+			
walnut	+						
piñon	+	+	+	+	+		+
juniper	+	+	+	+			+
squawberry			+				
yucca	+			+	+		
Grasses: grass family	+						
reedgrass	+						
Domesticates: corn	+			+	+		+
bean	+						+
squash	+						
gourd	+						

Table 205. Gallo botanical remains in a regional context

Time Period	Archaic-Early Pithouse	Early Pithouse-Early Pueblo	Archaic- Early Pueblo	Archaic-Late Pueblo	Archaic-Pueblo	Early-Late Pueblo	Late Pueblo
Site	Bat Cave[1]	Gallo[2]	Cordova Cave[3]	Tularosa Cave[4]	Kelly Ranch[5]	Carter Ranch[6]	Higgins Flat[7]
Annuals	*Amaranthus* *Chenopodium* *Helianthus* *Suaeda*	*Amaranthus* *Chenopodium* *Cleome* Compositae *Cycloloma* *Helianthus* *Nicotiana* *Physalis* *Portulaca*	*Helianthus* *Chenopodium* *Mentzelia* Proboscidea			*Helianthus*	*Chenopodium* *Datura* *Mentzelia* *Suaeda*
Cacti	*Opuntia*	*Opuntia*	*Echinocereus*	*Echinocereus*		*Opuntia*	*Opuntia*
Gossypium (cotton)							seeds
Grass	seeds	seeds	spikes, seeds	stem wads		seeds	
Perennials	*Juglans* *Juniperus* *Pinus edulis* *Quercus* *Scirpus*	*Juglans* *Juniperus* *Pinus edulis* *Rhus*	*Agave* *Cirsium* *Dasylirion* *Pinus edulis* *Quercus* *Juniperus* *Juglans* *Cercocarpus*	*Agave*	*Nolina* (matting)	*Juglans* *Juniperus* *Pinus edulis*	*Atriplex* *Juglans* *Juniperus* *Dasylirion*
Cucurbita foetidissima (wild gourd)	+		seeds, pulp, rind	pulp, rind, roots			rind, seeds
Cucurbita pepo (squash)	vessel, seeds, rind, peduncles	rind, seeds		peduncles, seeds	peduncles, rind	seeds	seeds
Lagenaria (gourd)		rind	rind		rind		seeds
Phragmites (reedgrass)	cigarettes	+	+				+

Time Period	Archaic-Early Pithouse	Early Pithouse-Early Pueblo	Archaic- Early Pueblo	Archaic-Late Pueblo	Archaic-Pueblo	Early-Late Pueblo	Late Pueblo
Phaseolus vulgaris (common bean)	+	+	pod	pods, beans	basket with 92 pounds of beans	+	+
Yucca	cordage, leaf bundle, netting, quids	seeds, pod, sandals, cordage	cordage, fiber wads, fruits, leaf fragments	fiber wads, fruit	fiber, headband, netting	fiber, pods, seeds	seed
Zea mays (corn)	husks, tassels, leaf sheaths, cobs, kernels	cobs, cupules, kernels	cobs, husks, kernels, stalks	cobs, husk wads	cobs, kernels, stalks	cobs	cobs, kernels

[1] Dick 1965; [2]This study; [3]Kaplan 1963; [4]Cutler 1952; [5]Cosgrove 1947:26; [6]Cutler 1964; [7]Cutler 1956

Table 206. Carbonized walnuts (*Juglans major*), LA 5407

Provenience (FS)	Whole Nuts		Halves		Plus Fragments	Weight (g)
	Height (mm)	Width (mm)	Height (mm)	Width (mm)		
Feature 25 [25-102]			1	17.1		.56
Feature 39 [39-36,-244,-247,-252,-457,-500]	16.7 (n=1)	16.0 (n=1)	13.7 (n=2) range 12.7-13.7	15.7 (n=3) range 13.4-18.1	9	3.27
Feature 39 [39-26][1]	?	?				?

[1]Specimen missing. Examined by R. Ford and listed as "1 complete *Juglans*."

Table 207. Carbonized piñon nuts (*Pinus edulis*), LA 5407

Provenience (FS)	Whole Nuts		Halves		Plus Fragments	Weight (g)
	Height (mm)	Width (mm)	Height (mm)	Width (mm)		
Feature 25 [25-110,-139]				7.3 (n=1)	5	.12
Feature 27 [27-35]					2	.01
Feature 39 [39-76,-249, -707]	10.0 (n=13) cv .065 range 9.1-10.4	6.4 (n=16) cv .120 range 5.5-8.3	10.8 (n=1)	7.1 (n=1)	5	1.11
TOTAL	10.0 (n=13) cv .065 range 9.1-10.4	6.4 (n=16) cv .120 range 5.5-8.3	10.8 (n=1)	7.2 (n=2) range 7.1-7.3	17	1.24

Table 208. Distribution of piñon remains at Gallo sites

Site and Provenience	Nuts	Cone Scales	Needles
LA 5407 Fea. 25, antechamber	2M		
Fea. 39, pit structure	1F, 2 M		2 F
Vessels	1F, 1 BC		
Fea. 27, extramural surface	1M		
LA 14906 Fea. 8, hearth			1F
LA 6075 Fea. 27, room floor			1F

LA 6076 Fea. 28, pit structure		1F	
Fea. 35 Room		1F	1F
LA 14858 Fea. 6, hearth	1F	1F	
LA 14909 Fea. 15, floor			1F
TOTAL	3F, 4M	3F	6F

All remains reported here are carbonized.
F = flotation samples; M = macrobotanical samples; BC = basket contents sample

Table 209. Gallo wood and charcoal by period and context (weight in grams)

Taxon	Early Pithouse (LA 5407)		Early Pueblo (LA 14858[1] and 14909[2])	
	Possible Burn Feature or Trash Deposits	Possible Roof Fall	Possible Burn Feature or Trash Deposits	Possible Roof Fall
	39-702, 30-8, 39-804, 33-3	25-186, 25-187, 25-199, 25-204, 25-209, 25-210, 25-211, 25-212, 25-213, 25-214,25-217, 25-218, 25-219, 25-222, 25-244, 39-20, 39-115, 39-129, 39-141, 39-150, 39-176, 39-177, 39-180, 39-546, 39-709, 39-805, 39-809, 39-817	(6-25, 15-10, 16-19)[1] (15-19)[2]	(15-9)[1] (16-12)[2]
CONIFERS: *Juniperus* (juniper)	2.6	13.4	1.4	0.9
Pinus (pine)	0.1	8.5		
Pinus edulis (piñon)	0.3	49.3	.5	0.1
Undetermined	0.2	4.5	1.3	0.6
Total Conifer	3.2	75.7	3.2	1.6
NON-CONIFERS: *Atriplex/Sarcobatus* (saltbush/greasewood)		0.1		
Cercocarpus (mountain mahogany)		9.7		
Populus/Salix (cottonwood/willow)		61.2		0.1
Quercus (oak)		16.3		
Phragmites (reedgrass)		0.4		
Undetermined nonconifer		0.3		0.1

Unknown		0.1		
Total Nonconifers		88.1		0.2
TOTAL SAMPLE	2.0	5.6	0.9	4.1

Table 210. Summary of Gallo habitation site information (early to late)

	LA 5407	LA 14908	LA 14858	LA 14909	LA 6076	LA 6075
Estimated dates	520-550	900-1170	1050-1150	1070-1150	1100-1200	1150-1200
Location	valley flats	hill base	hill side	hill base	hill side	flat ridge top
Architecture	pit structure (+ 3 pit structures)	none defined	8 rooms, pit structure	4 rooms	10 rooms, 2 pit structures	4 rooms, pit structure
Mealing facilities	pit structure, 3 grinding areas	none	4+ bins	none	metates on pit structure floor	none
Ceramics (N)	3811	1318	1209	915	3677	624
% from structures	70	0	48	14	40	49
Ground stone (N)	135	4 (3 concretions)	44	8 (+ 3 choppers)	103	16
% from structures	78	0	73	12	72	43
2-hand mano (N) Size range (cm) Length Width	44 16.5-23.7 5.8-17.5	0	17 14.0-21.0 7.0-12.0	2 16.8-19.5 11.1-14.9	24 17.5-21.3 7.6-11.8	4 13.5-15.4 9.7-11.3
Debitage (N)	725	217	25	100	477	139
Tools (N)	96	49	25	14	101	33
Projectile points	17	2	1	4	8	2
Material: debitage/tools	durable/durable	durable/durable	equal/brittle	durable/durable	equal/durable	brittle/durable
Miscellaneous artifacts	pipes, shell, crystal, azurite, malachite	none	none	none	shell	shell, malachite
Fauna (nonflotation) (N)	1013	11	56	55	103	139
Ratio cottontail: jackrabbit	1.4	0	14.0	0.32	0.5	2.2
% rabbit and small mammal	60	50	82	71	63	79

% artiodactyl, medium-large, and large mammal	40	50	18	29	37	21
Domesticates	corn, beans, squash, gourd		corn cob	corn, bean	sparse corn	none
Wild economic	goosefoot, pigweed, beeweed, sunflower, winged pigweed, groundcherry, purslane, walnuts, piñon, juniper, yucca, grasses, reedgrass		goosefoot, piñon, yucca	goosefoot, piñon, juniper	beeweed, prickly pear, piñon, juniper, yucca	goosefoot, winged pigweed, tobacco, piñon, juniper, squawberry
No. flotation samples	18		6	3	21	13

Table 211. Summary of Gallo fieldhouse and scatter sites

	LA 14882	LA 14907	LA 14910	LA 14906	LA 14920	LA 14930
Estimated dates	1050	1150-1170	unknown	Archaic and Early Pithouse	unknown	unknown
Location	hillside	rocky knoll top	valley bottom	gravel terrace/valley edge	rocky bench	valley bottom
Site type	fieldhouse	fieldhouse	fieldhouse	scatter/camp	scatter	scatter
Architecture	alignments only, no features	2 rooms	1 room + jacal	21-22 fire pits		
Ceramics (N)	212	50	26	231	6	0
Ground stone (N)	4	0	0	23-17 concretions	0	0
Grinding tools	2 one-hand manos, 1 metate fragment			5 one-hand manos, 1 metate fragment		
Debitage	11	18	2	820	203	403
Tools	0	3	2	44	22	9
Projectile points	0	0	0	5	2	4

Material: debitage/tools	durable	brittle/durable	durable/durable	durable/brittle	durable/durable	brittle/brittle
Miscellaneous artifacts				shell		
Fauna (N)	0	5	0	39	0	0
Macrobotanical		none		goosefoot, piñon, juniper		
No. flotation samples		1		4		